Chapter 2

Opening in the Refuge canopy: Erin Victory

Alternatives Considered, Including the Service-Preferred Alternative

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Introduction

This chapter describes our process for formulating alternatives, the actions that are common to all of the alternatives, and the three alternatives we analyzed in detail. At the end of this chapter, Table 2.1 compares how each of the alternatives addresses key issues, supports major programs, and achieves Refuge goals.

Formulating Alternatives

Relating Goals, Objectives, and Strategies

The Refuge goals are intentionally broad, descriptive statements of the desired future condition of Refuge resources. By design, they define the targets of our management actions in terms more prescriptive than quantitative. They also articulate the principal elements of the Refuge purposes and our vision statement, and provide a foundation for developing specific management objectives and strategies. All of the alternatives share the same goals.

The objectives are essentially incremental steps toward achieving a goal; they further define management targets in measurable terms. Typically, they vary among the alternatives, and provide the basis for determining strategies that are more detailed, monitoring Refuge accomplishments, and evaluating our successes. "Writing Refuge Management Goals and Objectives: A Handbook" (USFWS 2004a) recommends writing "SMART" objectives that are: (1) Specific; (2) Measurable; (3) Achievable; (4) Results-oriented and (5) Time-fixed.

Where possible, we incorporated the principles of Strategic Habitat Conservation in the development of our objectives and strategies. According to the National Ecological Assessment Team (NEAT 2006), "This approach focuses on the ability of the landscape to sustain species as expressed in measurable objectives. Developing a strategy to attain a biological outcome, such as a population objective, requires documented and testable assumptions to determine whether the objective is met." Not only will this approach ensure refuges are contributing to the National Wildlife Refuge System and USFWS mission and goals in a strategic, standardized and transparent way, but also refuges can ensure that they contribute to local and regional conservation priorities and goals as well (USFWS 2008b).

A rationale accompanies each objective to explain its context and importance. We will use the objectives in the alternative selected for the final CCP to write the Refuge step-down plans, which we describe later in this chapter.

The strategies for each objective are the specific or combined actions, tools, or techniques we may use to achieve the objective. The list of strategies in each objective represents the potential suite of actions we may implement. We will evaluate most of them further as to how, when, and where we should implement them when we write our Refuge step-down plans. We will measure our successes by how well our strategies achieve our objectives and goals.

Developing Alternatives, including the "No Action" Alternative

After we identified a wide range of possible management objectives and strategies that could achieve our goals, we began the process of designing management alternatives. Simply put, management alternatives are packages of complementary objectives and strategies designed to meet refuge purposes and the Refuge System mission and goals, while responding to both the internally- and externally-derived issues and opportunities that arose during the planning process.

We grouped the objectives that seemed to fit together in what we loosely called "alternative themes." For example, we considered such themes as "current management," "minimal management," "focal species management" and "active forest management." We formed those into three management alternatives,

after further evaluating how the objectives would interact, their compatibility with Refuge purposes, and the reality of accomplishing them within a reasonable period.

We fully analyze three alternatives in this chapter that characterize different ways of managing the Refuge over the next 15 years. We believe they represent a reasonable range of alternative proposals for achieving the Refuge purpose, vision and goals, and addressing the issues Chapter 1 describes. Unless otherwise noted, Service staff would implement all actions.

Alternative A satisfies the NEPA requirement of a "no action" alternative, which we define as continuing the status quo, or current management. It describes our existing management priorities and activities, and serves as a baseline for comparing and contrasting Alternatives B and C. We suggest you first read Chapter 3, "Description of the Affected Environment," for detailed descriptions of current Refuge resources and programs.

Many of the objectives in Alternative A do not strictly follow the guidance in the Service goals and objectives handbook, because we are describing current management decisions and activities that we established prior to that guidance. Our descriptions of those activities devolve from a variety of formal and informal management decisions and planning documents. Thus, the objectives in Alternative A are more subjective than are those in Alternatives B or C.

Alternative B, the Service-preferred alternative, combines the actions we believe would most effectively achieve the Refuge purposes, vision, goals, and response to public issues. It emphasizes the management of specific Refuge habitats to support focal species whose habitat needs benefit other species of conservation concern in the Lake Sunapee region. In particular, we emphasize habitat for priority bird species of conservation concern in the BCR 14 and PIF area 27 plans, NH WAP, Birds of Conservation Concern 2008, and other conservation plans at state and national scales. We strive to integrate the habitat management objectives for species of concern with maintaining the cultural heritage of the former John Hay estate. In addition, this alternative would enhance our present visitor services programs, with the addition of a seasonal staff.

Alternative C proposes more intensive forest management and wildlife dependent recreation, with a philosophy of maintaining the character and history of the forest, to the extent that it does not compromise the Refuge purposes and goals. Generally, white pine (*Pinus strobus*) and other native species would be encouraged to regenerate. The addition of permanent staff would enhance the visitor services program through a much broader array of programming and outreach.

Actions Common to All of the Alternatives

All of the alternatives share some common actions or elements. Some are required by law or policy, or represent management decisions that have undergone NEPA analysis and approval. Others may be administrative actions or elements that do not require public review, but which we want to highlight in this public document. All of these actions are current practices or policies that would continue under all alternatives, though with some differences in type or degree depending on the alternative. These differences are described further in the paragraphs following this list.

Those actions in common, which we discuss below, are

- providing Refuge staffing and administration,
- fostering partnerships,

- using an adaptive management approach (including strategic habitat conservation) where appropriate,
- protecting land,
- controlling invasive species,
- monitoring and abatement of diseases affecting wildlife and forest health,
- facilitating or conducting biological research and investigations,
- protecting cultural resources,
- facilitating wildlife-dependent recreational programs,
- completing findings of appropriate use and compatibility determinations,
- developing Refuge step-down plans,
- conducting a wilderness review,
- distributing refuge revenue sharing payments, and
- conducting additional NEPA analyses.

Refuge Staffing and Administration

Our proposals in this document do not constitute a commitment for staffing increases, or funding for operations, maintenance, or future land acquisition. Congress determines our annual budgets, which our Washington headquarters and regional offices distribute to the field stations. Chapter 3 presents our current levels of staffing and operating and maintenance funds for the Refuge. The activities shared among the alternatives that we describe below pertain to staffing, administration, and operations: some are new; others are ongoing. Implementing them supports all our Refuge goals. The alternatives describe different levels of programming as well as the level of staffing anticipated to implement them.

Permanent Staffing and Operational Budgets

In all the alternatives, our objective is to sustain levels of annual funding and staffing that allow us to achieve Refuge purposes, as interpreted by the goals, objectives, and strategies in this CCP. While special project funds are potentially available, their flexibility is limited because we cannot use them for any other priority project that may arise, and they typically only have a one- to two-year duration. As an unstaffed satellite refuge, John Hay NWR does not have its own base budget, and is instead managed through the Silvio O. Conte National Fish and Wildlife Refuge (NFWR) budget.

In response to declines in operational funding nationwide, we developed the "Strategic Workforce Plan for the National Wildlife Refuge System in Region 5" (Phase 2; January 16, 2007) to support a new base budget approach. Its goal is a maximum of 75 percent of a refuge station budget to cover salaries and fixed costs, while the remaining 25 percent or more will be operating and maintenance funds. Our strategy is to improve the capability of each refuge manager to do the project work of the highest priority, and not to have a refuge budget tied up in inflexible, fixed costs. Unfortunately, in a level or declining budget environment, that also may have implications for the level of permanent staffing.

Appendix D lists our Refuge Operating Needs (RONS) and Service Asset Maintenance Management System (SAMMS) construction and maintenance projects currently listed in those databases, and indicate the regional and refuge ranking. We also included new projects not yet in the databases, but proposed under Alternative B. Once approved, if funding is not available, we will continue to seek alternate means of accomplishing our projects; for example, through collaborative partnerships, volunteers, challenge cost share grants, or other partnership grants, and internships.

In all the alternatives, and within the guidelines of the new base budget approach, we would seek to achieve a level of staffing that would enable us to accomplish our highest priority projects. Alternatives B and C also propose additional temporary or permanent staff to provide depth in our visitor services programs (Appendix D). Appendix E identifies the staffing requests in each alternative.

Facilities Construction and Maintenance

Maintenance will be focused on addressing basic trail upkeep, signage, and safety concerns under all alternatives. In addition, the Woods Road would be maintained in its present condition due to its historical value, as well as its utility in providing access to the Refuge for public safety and/or management concerns and actions under all alternatives. In Alternatives B and C, the southern-most section of the road would provide a limited amount of parking for anglers, along with informational signage. The current gate would be moved as needed to control vehicular access beyond the area intended for parking. The pipeline from the well house that crosses the Refuge would be maintained as-needed. The addition of on-site staff under Alternatives B and C would most likely be situated at The Fells gatehouse.

Under Alternatives B and C we would construct an alternate route for the John Hay II Forest Ecology Trail (Ecology Trail) to allow visitors to return to the trailhead without entering The Fells' property. By constructing a trail section that returns to the trailhead entirely on Refuge property, visitors will be better informed of their options and can decide to continue on to The Fells property, for which there is admission, or to stay on the Refuge. Explanatory signage at the trailhead and at the point of entry to The Fells will be posted. Also under Alternatives B and C, the installation of a kiosk at the trailhead and interpretive and informational signs throughout the Refuge would be a priority to incrementally increase visitor awareness of Refuge resources. Included in this endeavor would be the addition of a spur trail to the fen and back, with informational signage on the ecology of fens. We will also continue to make progress toward improving access and visibility for visitors, including the installation of a footbridge(s) where stream crossing is a concern for public safety and stream health. Under Alternative C we would improve the Ecology Trail to be compliant with the Americans with Disabilities Act (ADA) and lead to a viewing platform at the lakeshore.

Brochure rack: Karen Terwilliger

Refuge Operating Hours

All of the alternatives will open the Refuge for appropriate and compatible public uses from official sunrise to sunset, seven days a week, to ensure visitor safety and protect Refuge resources. However, the Refuge manager does have the authority to issue a special use permit to allow access outside those periods. For example, we may permit access for research personnel at different times, or organized groups to conduct nocturnal activities, such as wildlife observation, or educational and interpretive programs.

Partnerships

The Fells has been a close partner since 1996, initially established to assist the Refuge in the day to day operations and maintenance of the Hay estate and grounds, and to provide educational opportunities. Many of these activities have been conducted under a Memorandum of Understanding (MOU) with the Service. With the completion of the land exchange in 2008, the relationship between the Service and The Fells has changed and a new MOU is needed to reflect this change. Under all alternatives, we will seek to establish an updated MOU that reflects the new tenets of our close partnership and that matches the cooperative spirit engendered in The Fells Master Plan (The Fells 2006). This would include recognizing the easement The Fells has on the viewshed corridor that is on Refuge lands, their commitment to maintaining it, the shared parking lot and proposed trailhead, educational programs, availability of workspace in the gatehouse for Service employees, and other facets that delineate our working relationship. We continue to appreciate and rely on the assistance of The Fells organization to provide general on-site oversight, the point-of-contact for the Refuge, and collaboration on land management issues.

All of the alternatives would maintain the existing partnerships identified in Chapter 3. These relationships are vital to our success in managing all aspects of the Refuge, from managing habitats and protecting species, to outreach and education, and providing wildlife-dependent recreation. The Fells, NH FGD, Society for the Protection of New Hampshire Forests (Forest Society), and Lake Sunapee Protective Association (LSPA) have been particularly important and valued partners.

Adaptive Management

All of the alternatives will include flexibility in management to allow us to respond to new information, spatial and temporal changes and environmental events, whether foreseen or unforeseen, or other factors that influence management. Our goal is to be able to respond quickly to any new information or events. The need for flexible or adaptive management is very compelling today because our present information on Refuge species and habitats is incomplete, provisional, and subject to change as our knowledge base improves. "Adaptive Management: The U.S. Department of the Interior Technical Guide (Williams et al. 2007)" promotes flexible decision-making, adjusting management in the face of uncertainties.

Adaptive management, as it relates to refuge management, promotes flexible decision-making through an iterative learning process that responds to uncertainties, new information, monitoring results, and natural variability in the ecosystems. It is designed to facilitate more effective decisions and enhanced benefits. At the refuge level, monitoring management actions and outcomes and key resources will be very important. The Refuge manager is responsible for changing management objectives or strategies as new information is acquired. Substantial changes from what we present in our final CCP may warrant additional NEPA analysis and public comment. Minor changes will not, but we will document them in our project evaluation reports or annual reports.

Generally, we can increase monitoring and research that support adaptive management without additional NEPA analysis, assuming the activities, if conducted by non-Refuge personnel, are designated a Categorical Exclusion (Department of Interior Manual 516 DM 2.3A(2) and 516 DM 6, Appendix 1,

January 16, 1997) and determined to be compatible by the Refuge manager in a compatibility determination.

Strategic Habitat Conservation

Strategic Habitat Conservation is a framework that utilizes adaptive management to redefine broad scale conservation from the general pursuit of conserving "more" habitat and species, to a more planned approach based on scientific data, at a landscape level, and in cooperation with partners. It starts with explicit, measurable objectives that are based on testable assumptions that can be evaluated, and is enacted through an iterative process of biological planning, conservation design, conservation delivery, assumption-driven research, and outcome-based monitoring. The goal is to set specific population objectives for species that are limited in some way by habitat (though this would be effective for other limiting factors as well), and to use targeted habitat management approaches to meet those objectives. Inherent in the process is a continual evaluation of biological outcomes and approaches, with the intent to adapt the overall conservation strategy to respond to changing circumstances and new information.

Protecting Land

The permanent protection of land is the keystone of wildlife and habitat conservation. Land brought into the Refuge System will be available forever to support fish, wildlife and plants. We can restore, enhance, or maintain the land owned by the United States and managed as part of the Refuge System to provide suitable conditions for priority species targeted for conservation, such as threatened or endangered species and those whose populations are in decline. The land we protect through conservation easements will never convert to uses that would remove permanently their value for fish and wildlife.

Though the Refuge encompasses the approved acquisition boundary, it is part of a regional matrix of conserved land. It is our goal to create new and enhance our existing conservation partnerships to both encourage and provide education about land conservation in the region.

To continue our progress toward our shared objectives in protecting land, we will employ the following, ongoing strategies.

1. Participate in local land protection meetings with partners to facilitate communication and cooperation.

2. Provide information to elected officials on land protection issues upon request.

3. Work with partners and landowners to encourage land conservation outside the Refuge boundary.

4. Keep communities around the Refuge informed about land protection issues through the distribution of outreach material and personal appearances by staff.

Managing Invasive Species

The Refuge System has identified management to control the establishment and spread of invasive species as a national priority. This is a substantial problem that reaches across all habitat types. For the purposes of this discussion, we use the definition of invasive species contained in the Service Manual (620 FW 1.4E): "Invasive species are alien species whose introduction does or is likely to cause economic or environmental harm, or harm to human health. Alien species, or non-indigenous species, are species that are not native to a particular ecosystem. We are prohibited by Executive Order, law, and policy from authorizing, funding, or carrying out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere."

Japanese barberry: Bill Nichols

Fortunately, the occurrence of invasive species on the Refuge is low. To date, only Japanese barberry (*Berberis thunbergii*) has been documented in two places on the property, although the Refuge has not completed a systematic survey. Our objective in all alternatives is to continue to work with our partners to monitor invasive species on the property. Under Alternatives B and C, as staffing and funding allow, we will endeavor to prevent the establishment of new invasive species, and we will manage to control the spread of what does exist. For plant and animal invasive aquatic species, we would coordinate with LSPA and NH FGD for monitoring and treatment in nearshore Refuge habitat, and in Beech Brook. To the extent possible, we will physically remove invasive species where they are encountered.

In conjunction with the HMP and IMP, we will develop a list of species of greatest concern on the Refuge, identify priority areas in which to be vigilant, and establish monitoring and treatment strategies for invasive species in these areas, the degree to which would vary by alternative. The Refuge would accomplish this through coordination with Conte Complex and regional staff, as well as our other partners including LSPA and NH FGD. Refer to the National Wildlife Refuge System Invasive Species Management Strategy released in May 2004 (USFWS 2004b) for additional tools, processes, and strategies. The 2004 report is complemented by a technical report issued in May 2005 by the U.S. Geological Survey (USGS) titled: The Invasive Species Survey: A Report on the Invasion of the National Wildlife Refuge System (USGS 2005). These reports together give both a status review and a management strategy for combating invasive species. In addition, we will stay abreast of Service policy revisions currently being reworked to facilitate implementation.

Integrated Pest Management

In accordance with 517 DM 1 and 7 RM 14, an integrated pest management approach would be utilized, where practicable, to eradicate, control, or contain pest and invasive species (hereafter collectively referred to as pests) on the Refuge. Biological or mechanical means would be considered first, before chemical means.

IPM would involve using methods based upon effectiveness, cost, and minimal ecological disruption, which considers minimum potential effects to non-target organisms and the Refuge environment. If deemed necessary, pesticide uses with appropriate and practical best management practices (BMPs) for habitat management would be approved for use on the Refuge where there likely would be only minor, temporary, and localized effects to non-target species and environmental quality based upon non-exceedance of threshold values in Chemical Profiles. Pesticides may be used on a refuge where

substantial effects to species and the environment are possible (exceed threshold values) in order to protect human health and safety (e.g., mosquito-borne disease).

The Refuge's IPM program is one of the top ten step-down plans from the CCP prioritized by the Refuge. Once written, it will be on file at the Refuge Complex headquarters. It supplements both the CCP and HMP with documentation on how to manage invasive or pest species. Along with a more detailed discussion of IPM techniques, this documentation describes the selective use of pesticides for pest management on the Refuge, where necessary.

We will refine our control program to address the most critical problems first. We may adjust our priorities to reflect regional Service priorities, the availability of new information, or a new resource.

Monitoring and Abating Wildlife and Plant Diseases

The Service has not yet published its manual chapter on Disease Prevention and Control. In the meantime, we derive guidance on this topic from the Refuge Manual and specific directives from the Director of the Fish and Wildlife Service or the Secretary of the Interior. The Refuge Manual (7 RM 17.3) lists three objectives for the prevention and control of disease.

1. Manage wildlife populations and habitats to minimize the likelihood of the contraction and contagion of disease.

2. Provide for the early detection and identification of disease mortality when it occurs.

3. Minimize the losses of wildlife from outbreaks of disease.

The Service published those objectives in 1982. Since then, in addition to diseases that cause serious mortality among wildlife, diseases transmitted through wildlife to humans have received more attention. One example is Lyme disease. In 2002, the Service published a Service Manual chapter (242 FW 5) on Lyme Disease Prevention to inform employees, volunteers, and national service workers about this disease, its prevention, and treatment.

Other serious wildlife diseases include avian influenza and chronic wasting disease. In addition to the diseases of wildlife, the Service will be attentive to the diseases that affect forest health. Human activities that dramatically alter the landscape, such as development and sprawl, forest fragmentation, new road and utility construction, agriculture, introduction of non-native invasive species, and transport of disease-bearing hosts through the landscaping trade, can weaken and degrade the quality of habitats, particularly of trees and forests. These actions would be coordinated through Conte Complex and regional staff, as well as through local partners including NH FGD, Forest Society and others.

These are the general strategies for preventing or controlling disease.

1. Continue to conduct disease surveillance in conjunction with any fieldwork.

2. Cooperate with state agencies, particularly the New Hampshire Fish and Game Department, or New Hampshire Division of Forests and Lands, in conducting surveillance, providing access for sampling, and following protocols in the event of an outbreak.

3. Inform volunteers and others who work in the field about the dangers of Lyme disease and measures to avoid contracting it.

4. Work with partners to monitor Refuge forests for indicators of the increased occurrence of pests or disease. For example, note signs of physical damage, decay, weakening, sudden death, particularly of

canopy and source trees of major host species, and changes in wildlife use of habitats, such as the absence of breeding birds that used to appear regularly, or changes in flowering or fruiting phenology.

5. Follow the protocols in national, state, and Refuge disease prevention and control plans.

Biological and Ecological Research and Investigations

The Refuge Manual and the Service Manual both contain guidance on conducting and facilitating biological and ecological research and investigations on refuges. In 1982, the Service published three objectives in the Refuge Manual for supporting research on units of the Refuge System (4 RM 6.2):

1. to promote new information and improve the basis for, and quality of, refuge and other Service management decisions;

2. to expand the body of scientific knowledge about fish and wildlife, their habitats, the use of these resources, appropriate resource management, and the environment in general; and,

3. to provide the opportunity for students and others to learn the principles of field research.

In 2006, the Service Manual provided supplemental guidance on the appropriateness of research on refuges: "We actively encourage cooperative natural and cultural research activities that address our management needs. We also encourage research related to the management of priority general public uses. Such research activities are generally appropriate. However, we must review all research activities to decide if they are appropriate or not as defined in section 1.11. Research that directly benefits refuge management has priority over other research." (603 FW 1.10D (4))

All research conducted on the Refuge must be determined in writing to be both appropriate and compatible, unless we determine it to be an administrative activity. Research projects also must contribute to a need identified by the Refuge or the Service. The Refuge manager also may consider requests that do not relate directly to Refuge objectives, but to the protection or enhancement of native species and biological diversity in the region and that support the goals of recognized ecoregional conservation teams, such as the Atlantic Coast or Eastern Brook Trout Joint Ventures. Under all alternatives, we will generally approve special use permits that provide a direct benefit to the Refuge, or for research that will strengthen our decisions on managing natural resources on the Refuge.

Protecting Cultural Resources

As a federal land management agency, we are responsible for locating and protecting all historic resources: specifically, archaeological sites and historic structures eligible for listing or listed on the National Register of Historic Places. That applies not only to Refuge land, but also to land affected by Refuge activities, and includes any museum properties. The New Hampshire State Historical Preservation Office (NH SHPO) has indicated a high potential for archaeological sites to be on the Refuge. Considering the proximity to water (Lake Sunapee and Beech Brook), it is likely that prehistoric or historic sites could be discovered on the Refuge in the future.

Under all the alternatives, we will evaluate the potential for impact on archaeological and historical resources as required, and will consult with the NH SHPO in program or project implementation, especially any ground disturbing activities. These procedures will ensure that we comply with Section 106 of the National Historic Preservation Act, regardless of the alternative. That compliance may require any or all of the following: a State Historic Preservation Records survey, literature survey, or field survey.

Wildlife-Dependent Recreational Program

The National Wildlife Refuge System Improvement Act of 1997 designated six priority public uses on national wildlife refuges: hunting, fishing, wildlife observation and photography, and environmental education and interpretation. The latter four are available under all alternatives to varying degrees as staffing and funding allows. Fishing would be allowed under Alternatives B and C, and the possibility of instituting a tightly controlled, limited hunting season would be analyzed further under Alternative C. Per the General Guidelines for Wildlife-Dependent Recreation, Fish and Wildlife Service Manual, 605 FW 1, we will strive to meet the following criteria for a quality wildlife-dependent recreation program:

1. promotes safety of participants, other visitors, and facilities;

2. promotes compliance with applicable laws and regulations and responsible behavior;

3. minimizes or eliminates conflict with fish and wildlife population or habitat goals or objectives in an approved plan;

4. minimizes or eliminates conflicts with other compatible wildlife-dependent recreation;

5. minimizes conflicts with neighboring landowners;

6. promotes accessibility and availability to a broad spectrum of the American people;

7. promotes resource stewardship and conservation;

8. promotes public understanding and increases public appreciation of America's natural resources and our role in managing and

9. conserving these resources;

10. provides reliable/reasonable opportunities to experience wildlife;

11. uses facilities that are accessible to people and blend into the natural setting; and,

12. uses visitor satisfaction to help to define and evaluate programs.

Appropriateness and Compatibility Determinations

Chapter 1 describes the requirements for determinations of appropriateness and compatibility. Appendix B includes draft appropriateness and compatibility determinations to support the activities in Alternative B, the Service-preferred alternative. Most of these will be the same for all three alternatives, with the exception of fishing and hunting. Under Alternative B, a compatibility determination for fishing would be included (see Appendix B). Under Alternative C, separate compatibility determinations for fishing and hunting would be included. Our final CCP will include the approved compatibility determinations for the alternative selected. We will allow only the activities determined appropriate and compatible as prescribed in Service policy 603 FW 1 and 2. As noted above, hunting, fishing, wildlife observation and photography, and environmental education and interpretation, when compatible, are the priority general wildlife-dependent uses of the National Wildlife Refuge System. According to Service policy 603 FW 1.3, these six wildlife-dependent recreational uses are determined to be appropriate, and therefore, do not require a separate Finding of Appropriateness. Service Manual 605 FW 1 states that these uses should receive preferential consideration in refuge planning and management before the refuge manager analyzes other recreational opportunities for appropriateness and compatibility.

Activities Not Allowed

We have received requests for non-priority, non-wildlife-dependent activities that we have never allowed on this Refuge. There are also some activities that were allowed when the Refuge included the Hay estate buildings and grounds, but those determinations have expired. Those activities were determined compatible in 1994, but are now obsolete. Under all alternatives, the activities evaluated by the Refuge manager and determined not to be appropriate on Refuge lands, are: motorized vehicles of any kind, backpacking (i.e., to carry a pack containing gear and provisions to camp; however, hiking with a day pack is allowed), camping, picnicking (this refers to the traditional sense of the term and is not meant to prohibit people from eating food while engaged in approved activities), biking, jogging, pet dogs, horseback riding, or geocaching. Appendix B provides the appropriateness and compatibility documents that apply to the Service-preferred alternative, and outlines the Refuge manager's decision on the appropriateness of the activities above in accordance with the policy (see Chapter 1). Other ownerships nearby sufficiently provide most of those activities, so the lack of access on the Refuge does not eliminate those opportunities in the Lake Sunapee region. According to Service policy, (603 FW 1), if the Refuge manager determines a use is not appropriate, it can be denied without determining its compatibility.

Developing Refuge Step-down Plans

Service planning policy identifies 25 step-down plans that may be applicable on any given refuge. We have identified the 10 plans below as the most relevant to this planning process, and we have prioritized their completion, if they are not already developed. This draft CCP presents sections of the Refuge HMP that require public review; we will incorporate them into the final version of the HMP immediately after the approval of the final CCP.

We will also develop an AHWP and IMP as the highest priority step-down plans, regardless of the alternative selected for implementation. We describe them in more detail below. To keep them relevant we will modify and update them as we obtain new information. All of the alternatives schedule the completion of these step-down management plans.

- a HMP, which we will immediately begin working on following CCP approval (see discussion below, and discussion on NEPA requirements on page 2-13)
- an AHWP, annually after CCP approval (see discussion below)
- a IMP, within 2 years of CCP approval (see discussion below)
- a Visitor Services Plan, within 3 years of CCP approval
- a Law Enforcement Plan, within 3 years of CCP approval
- a Safety Plan, within 3 years of CCP approval.
- a Fire Plan, within 5 years of CCP approval
- a Facilities and Sign Plan, within 5 years of CCP approval
- an Integrated Pest Management Plan, within 5 years of CCP approval
- a Fish plan, within 2 years of CCP approval under Alternatives B and C
- a Hunt plan, within 5 years of CCP approval under Alternative C

Habitat Management Plan

A HMP for the Refuge is the requisite first step toward achieving the objectives of Goal 1, regardless of the alternative selected for implementation. For example, the HMP will incorporate the selected alternative's habitat objectives developed herein, and will identify "what, which, how, and when" actions and strategies we would implement over the 15-year period to achieve those objectives. Specifically, the HMP will define management areas and treatment units, identify the type or method of treatment, establish the timing for management actions, and define how we will measure success over the next 15 years. In this CCP, the goals, objectives, and list of strategies in each objective identify how we intend to manage habitats on the Refuge. We base both the CCP and HMP on current resource information, published research, and our own field experiences. We will update our methods, timing, and techniques as new, credible information becomes available. As appropriate, we will incorporate the actions common to all alternatives into the HMP.

Annual Habitat Work Plan and Inventory and Monitoring Plan

The AHWP and IMP for the Refuge are also priorities for completion upon CCP approval. Regardless of the alternative chosen, those plans also are vital for implementing habitat management actions and measuring our success in meeting the objectives. Each year, we will generate from the HMP an AHWP that will outline specific management activities for that year. The IMP will outline the methodology to assess whether our original assumptions and proposed management actions support our habitat and species objectives. We will prioritize our inventory and monitoring needs in the IMP. The results of inventories and monitoring will provide us with more information on the status of our natural resources and allow us to make more informed management decisions.

Conducting a Wilderness Review

The Refuge System planning policy requires that we conduct a wilderness review during the CCP process. The first step is to inventory all refuge lands and waters the Service owns in fee simple. Our inventory of this Refuge determined that no areas meet the eligibility criteria for a wilderness study area as defined by the Wilderness Act. Therefore, we did not analyze further the Refuge's suitability for wilderness designation. See Appendix C for the results of the wilderness review. The Refuge will undergo another wilderness review in 15 years as part of the next comprehensive conservation planning process.

Distributing Refuge Revenue Sharing Payments

As we describe in Chapter 3, we pay the Town of Newbury in New Hampshire annual refuge revenue sharing payments based on the acreage and the appraised value of Refuge lands in their jurisdiction. Those annual payments are calculated by formula determined by, and with funds appropriated by, Congress. All of the alternatives will continue those payments in accordance with the law, commensurate with changes in the appraised market value of Refuge lands, and new appropriation levels dictated by Congress.

NEPA Analysis

For all major federal actions, NEPA requires the site-specific analysis and disclosure of their impacts, either in an EA or in an EIS. Generally, those include the administrative actions listed in Chapter 4. Most of the actions proposed in the three alternatives and fully analyzed in this draft are described in enough detail to comply with NEPA, and would not require additional environmental analysis. Although this list is not all-inclusive, the following projects do not require additional NEPA analysis:

- the HMP, including its forest and meadow management programs;
- the IMP;
- addition of a trailhead kiosk or other educational trail improvements for visitor services;
- relocation of, or installation of a footbridge(s) on, the Ecology Trail that crosses and follows Beech Brook;
- addition of a small parking area on the Woods Road at the southeast corner of the Refuge;
- installation of a primitive foot trail from the above parking site to Lake Sunapee for fishing;
- addition of a primitive foot trail section to allow visitors to complete the Ecology Trail without entering onto The Fells property;
- addition of a primitive foot trail section to allow visitors to visit the fen;
- expanding or reducing priority public use programs;
- controlling invasive plants.

Alternatives Considered, but Eliminated from Further Study

1) Turn over Refuge management to The Fells

When The Fells became a 501c(3) organization, its purpose was to assist the John Hay Refuge in maintaining the Hay estate buildings and grounds, and to provide historical and educational programs for interested members of the public. In 2008, they were granted fee title ownership of the Hay estate buildings and grounds, and continue to provide quality programs on the Hay estate. As the adjacent landowner and former friends group, they continue to be invaluable Refuge partners, and an on-site presence. They are not, however, a natural resource agency with the mission and resources necessary to manage land for wildlife habitat and natural resource stewardship. Therefore, turning management of the Refuge over to The Fells would be a mismatch of organizational missions and capabilities.

2) Woodcock-focused management

The American woodcock is a game species of regional concern, due to a decades-long trend of population declines. Here in the Northeast, this is due in large part to a decline in available habitat. Woodcock require both open fields and early successional forest habitat for courtship and breeding. During John Hay's tenure on the property, the landscape was dominated by farming, which provided an abundance of open field habitat. Over the last century, forests throughout New Hampshire and the Northeast have reclaimed the landscape, decreasing the availability of open fields and early successional forest. While we could manage the Refuge forest to provide this mix of required habitat for woodcock, it would alter its present character. We chose instead to honor the consensus of opinion by the planning team, Refuge partners and members of the public, that the Refuge's

contribution to the region was in its unique character of large pines and mature forest habitat. In addition, public scoping highlighted the desire within the community to see the minimal forest management approach undertaken by the Hays to persist in future management of the site, and it is our intention to honor that where possible.

3) Clearcut to restore cultural farm-era landscape

While razing the Refuge forest would create a landscape more similar to the time when John Hay first began purchasing the land, it would also be a contradiction to the way the Hays chose to manage the land over the last century. The Fells viewshed that cuts across the Refuge provides a reminder of what the scenic views of the lake once were, but over time the Hays allowed the forest to reclaim that land, and it is our intention to honor their land management philosophy as circumstances allow. We see the unique contribution of the Refuge to the larger landscape in its large pines and mature forest habitat.

4) White pine plantation

Large, legacy white pines are a unique and prominent feature at the Refuge. This is in large part due to the minimal forest management by the Hays over the last century. These trees are remnants of the reversion of farm fields into forest at the turn of the previous century and as such are part of the cultural legacy of the Refuge. To ensure that white pine trees persist in the Refuge forest, some level of silvicultural intervention is generally recommended to provide the conditions required for pine regeneration. While initiating a pine plantation is one option, this would require considerable alteration of the current forest. Moreover, the current forest character would be lost, replaced by an unnatural, monotypic forest type that would likely impact the diversity of wildlife present. Given the Refuge's small size and its contribution to the biological diversity of the landscape in providing mature forest habitat, which is locally unique, we chose not to consider this option.

Alternative A. Current Management

This alternative describes our current Refuge programs on approximately 80 acres for habitat management, fish and wildlife inventories and monitoring, administrative infrastructure and staffing, and visitor services. This alternative describes a "snapshot in time" of current management actions. Under current management, we use an adaptive management approach of modifying actions based on new information with a constant effort to collect more and better data upon which to make management decisions. Chapter 3 presents the types of Refuge habitat, in Table 3.5 and Map 3-2.

Habitat Management

Current habitat management activities are minimal, and primarily allow natural processes to shape Refuge habitats. The relatively small size of the Refuge, lack of on-site staff, and current funding and staffing levels at the Refuge Complex do not warrant more active management. Part of the Refuge's contribution to the local landscape is its mature upland forest in a landscape of mostly younger stands. The close proximity of our conservation partners and their level of cooperation, however, do allow us to accomplish basic forest health monitoring, and a minimum level of Refuge maintenance and routine management activities. A recent habitat inventory was conducted that described forest species composition by management unit in Table 3.4, and types of Refuge habitat in Table 3.5, and Map 3-2.

Under current management, we would continue to passively manage Refuge lands through collaboration with partners and the Service would have minimal presence. Habitat management would be limited to promoting visitor safety (e.g., dropping snags that pose a threat along the Ecology Trail) and responding to invasive plants or animals that can impact habitat integrity or priority wildlife. No other active wildlife

or habitat management would occur. Minimal coordination with The Fells, Forest Society, LSPA, and NH Audubon for wildlife, water quality and habitat protection would continue on an as-needed basis.

Inventories and Monitoring

Under current management, the Service does not conduct any systematic surveys or monitoring, though a habitat inventory and mapping project was just completed for the Refuge in October 2008. As with all of our activities, the degree to which we can conduct monitoring and inventories depends on the availability of funding and staff, including the contributions of partners and volunteers. Current levels preclude our ability to conduct these activities, and under this alternative, no further inventories, surveys or monitoring efforts would be scheduled for the Refuge given current conditions and circumstances.

Visitor Services

The current level and types of visitor services would continue on the Refuge (Map 2-1). The Service would maintain its passive oversight and minimal presence, while visitor services are implemented by partners, primarily The Fells. In recent years, The Fells estimates that they have reached 11,773 visitors per year with their organization's messaging and information (K. Zurheide, personal communication (pers. comm.); for the complete citation of all personal communication references, please see the Bibliography). Over a six month period (October 2007 to April 2008), we estimated that about 1,850 visitors to The Fells also visited the Refuge. Minimal collaborative educational and interpretive programming occurs and is primarily conducted by The Fells, Forest Society, and LSPA. Wildlife observation and photography continue to be the primary uses of the Refuge.

Key adjacent landowners (e.g., The Fells, Forest Society, and NH Audubon) have similar but differently focused missions and corresponding uses and policies on their neighboring lands. Due to the juxtaposition of the Refuge in the larger conserved forest landscape, it is part of a local matrix of recreational and public use opportunities. Presently, the Service coordinates with partners through passive oversight of the Refuge, but all six of the wildlife-dependent priority public uses are collectively available through these key landowners in accordance with their specific management and visitor services objectives.

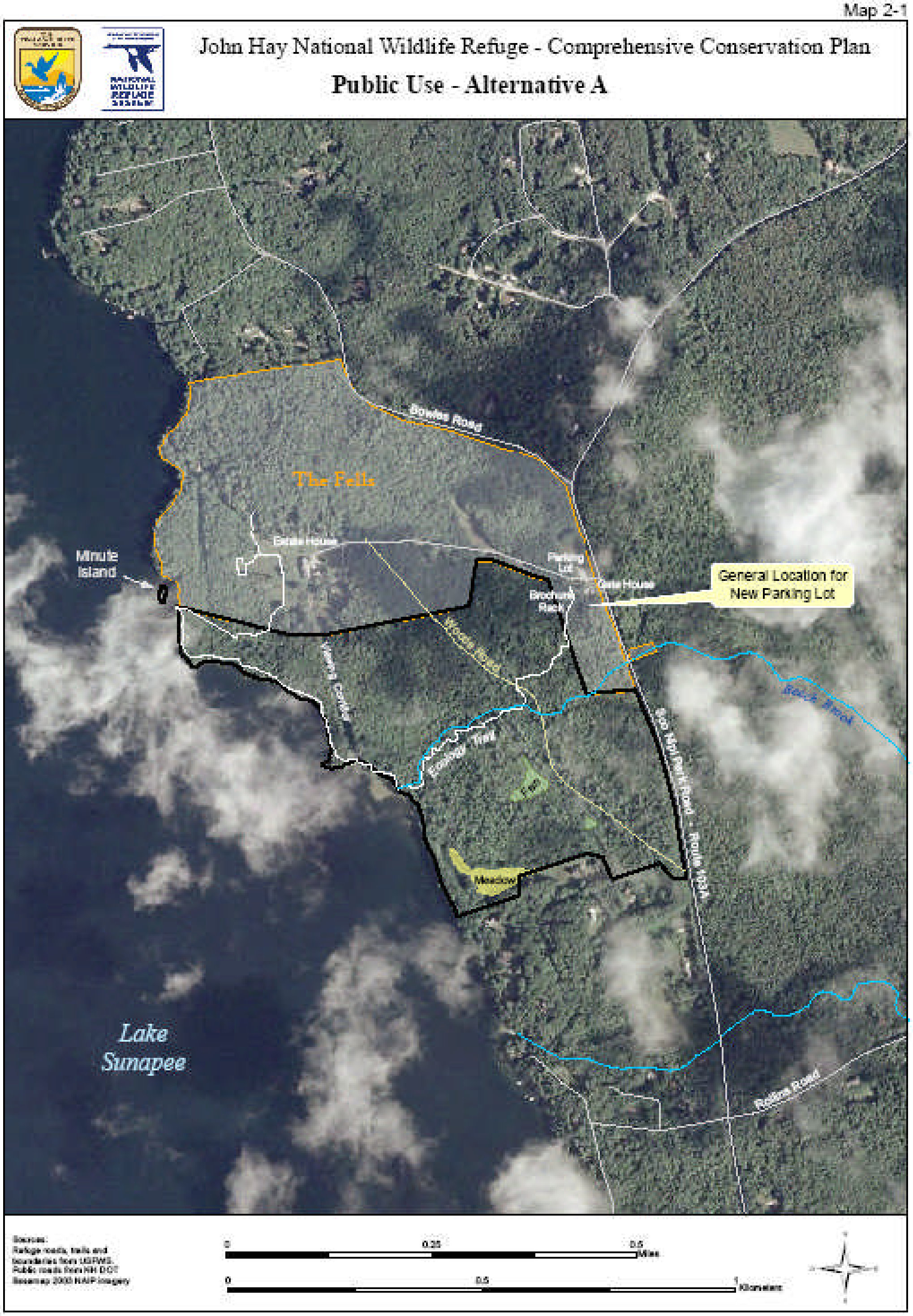
Refuge Administration

In this alternative, the primary staff responsible for the John Hay Refuge would remain stationed at the Sunderland, MA Refuge Complex headquarters. Administration of visitor services, land protection, biological and law enforcement activities would be handled by existing staff from the Conte Complex.

We would maintain our current minimal visitor services, biological, law enforcement, and administration through the Sunderland office as funds and staffing permit. The Service would maintain its passive oversight through educational materials such as the Ecology Trail guide and continue to rely on The Fells to provide on-site presence. As opportunities arise to enhance these programs through partnerships, they would be evaluated as staffing and funding allow. No new facilities or staffing would be proposed, but these needs would be approached through partnerships. Formerly the Friends group to the Refuge, The Fells has been responsible for much of the routine maintenance of the estate and gardens under an MOU with the Service, reflecting the relationship prior to the land exchange. That MOU needs to be updated and renewed to reflect the current relationship as adjacent landowners and as collaborative partners that share resources. This includes the use of The Fells parking lot, which is currently located on the north side of the gatehouse. This agreement would still apply if The Fells completes their plan to move this parking lot to the south side of the gatehouse to accommodate a larger number of cars.

In the discussion that follows, we describe in detail the goals, objectives, and strategies that we would implement under Alternative A.

Map 2-1


John Hay National Wildlife Refuge - Comprehensive Conservation Plan
Public Use - Alternative A
Bowles Road
The Fells
Estate House
Parking Lot
Gate House
General Location for New Parking Lot
Minute Island
Ecology Trail
Meadow
Lake Sunapee
Rollins Road
Sources:
Refuge roads, trails and boundaries from USFWS.
Public roads from NH DOT
Basemap 2003 NAIP imagery
0
0.25
0.5
Miles
0
0.5
1
Kilometers

Goal 1. Contribute to the biological diversity and integrity of the Atlantic northern forest in the larger context of the Lake Sunapee region and Connecticut River watershed by protecting, enhancing, and restoring the Refuge's habitats, with an emphasis on breeding, migrating, and wintering birds.

Objective 1.1 Forest Habitat

Over the next 15 years, continue to allow the 77.6 acres of mature upland forest to be shaped by natural processes (e.g., mortality, blow downs) that may encourage natural regeneration, maintain the cultural legacy and diversify the forest structure that supports migratory and nesting birds of conservation concern in BCR 14 and NH WAP. This includes, but is not limited to, the Canada warbler and wood thrush.

Rationale

The Refuge consists of nearly 80 acres of mature, upland transitional hardwood-conifer forest. According to the NH Wildlife Action Plan, it is characterized as part of the hemlock-hardwood-pine matrix forest habitat, which covers nearly 50 percent of the state's land area (NH FGD 2005). Yet, despite its abundance, it is listed as one of the state's most at-risk habitats due to the threat of fragmentation through human development and the introduction of invasive species (NH FGD 2005).

The Service has the responsibility for protecting migratory birds under international migratory bird treaties with Mexico and Canada, and to uphold the establishing purpose of the Refuge as a wildlife and migratory bird reservation. In fulfilling these mandates, the Refuge would strive to provide quality, mature forest habitat and to consider the needs of birds of conservation concern according to state and regional conservation plans.

According to these regional plans, two species using the Refuge of high priority conservation status are the Canada warbler and wood thrush. Both species have shown regional declines over the last forty years, and this is attributed to a lack of diversity in forest composition and age class in Northern New England (Dettmers [updated 2006], Hodgman and Rosenberg 2000). In concert with adjacent conservation lands, the Refuge provides additional habitat for species of regional conservation concern. We would continue to allow natural processes rather than active forest management to shape Refuge forests, and continue to work with our partners to monitor forest health. Should a disturbance event such as a windstorm or wildfire reset a portion or all of the mature forest, the Refuge would allow habitat to recover through natural succession.

Strategies

Continue to:

- Eliminate trees that present safety hazards as needed, where brought to the attention of the Service. These would be trees that have fallen or are leaning over the trail or other key visitor use areas to maintain safety and access. Hazard trees would be dropped and left in place to serve as coarse woody debris used as foraging sites and cover by wildlife, and to replenish soil nutrients. On other areas of the Refuge, dead or dying trees would be left as part of the natural processes.
- Treat for disease and insect outbreaks as needed by working with state and local partners to prevent excessive losses on the Refuge or from affecting adjacent lands.

Accountability Measures

- Forest acreage by species and structure, based on the forest inventory from 2008.
- Number of acres impacted by natural processes and the resultant compositional and structural changes.

Objective 1.2 Meadow Habitat

Over the next 15 years, continue to maintain the existing 1.4 acres of meadow on the southern boundary of the Refuge to support species of conservation concern such as the American woodcock and other species dependent upon meadow habitat.

Rationale

In the past, fields and other open lands were maintained through natural processes such as fire, extreme weather events, herbivory, and beaver activity (NH FGD 2005). Native Americans created and maintained localized grassy areas through the regular use of fire, and early European settlers created openings through timber harvesting, firewood collection, agriculture and controlled burning (see Chapter 3). By the mid-1800's, there were over 2 million acres of grassland throughout New Hampshire. Today, after the abandonment of farms, the suppression of natural events including fire, and the reversion of much of the land back to forest, there is approximately 250,000 acres of grassland in the state, and much of that is too intensively worked to be suitable for wildlife (NH FGD 2005).

The Refuge has one open meadow approximately 1.4 acres in size. Although small, the meadow provides habitat for American woodcock, which has been documented on the property. Open meadow is a requirement for males to perform their well-known courtship displays to attract females, and singing ground surveys have shown a steady decline of 1.9 percent per year in the eastern portion of their range (Kelley et al. (eds) 2008). Due to range-wide declines and the loss of habitat, American woodcock is listed as a priority species of conservation concern by both BCR 14 and PIF 27, and as a species of greatest conservation need (SGCN) in New Hampshire.

Historically mowed by an adjacent landowner, the meadow supports a mix of grasses and wildflowers, providing a mix of seeds, nectar, and other food sources for foraging birds, insect pollinators, and other animals that use open areas throughout the year. The Refuge would continue to maintain this meadow via periodic mowing by our staff, contract, or a Special Use Permit to benefit species requiring open fields including American woodcock.

Strategies

Continue to:

- Conduct meadow maintenance to retain a primarily herbaceous composition (through partners or adjacent landowners).

Accountability Measures

- Number of acres of meadow.

Objective 1.3 Wetlands Habitat

Over the next 15 years, continue to allow natural processes to influence fens, vernal pools and other wetland habitats on the Refuge that may provide important breeding and foraging habitat for amphibians and reptiles of conservation concern, such as spotted salamander (*Ambystoma maculatum*), identified in the NH Wildlife Action Plan, Northeast PARC (NE PARC), and other regional plans.

Rationale

Refuge habitat is primarily upland forest, but wetland habitats include two fens that total approximately one acre, and one vernal pool. These wetland communities are small, but are still important to some plants and animals of conservation concern. Vernal pools are categorized as one of the most at-risk habitat types in New Hampshire (NH FGD 2005). Though found statewide, they have no regulatory protection and are not well documented, and therefore they are often overlooked during development projects, and are filled in or otherwise lost.

Vernal pools are slight depressions in the ground that hold water for a period of time in the spring and summer before eventually drying out. Some vernal pools also fill up in the fall. A suite of vernal pool-obligate species require the presence of these ephemeral pools of water to lay their eggs in as part of their life cycle. Vernal pool-obligate species include the spotted salamander, blue-spotted salamander, wood frog (*Rana sylvatica*), and fairy shrimp (*Eubranchipus sp*.; NH FGD 2005). Wood frogs and spotted salamanders are documented on the Refuge.

Fens, a type of peatland, are perennial wetland systems with a limited supply of ground and surface water that slowly decay organic matter over time resulting in a buildup of peat. Often characterized by the types of vegetation, such as sedges, grasses, other herbaceous plants, and shrubs, they often support rare plant species specifically adapted to the nutrient levels and pH conditions. We recognize these plant communities as important components of the region's native biological diversity and seek to maintain the health of these areas in keeping with the Service's Biological Integrity, Diversity, and Environmental Health policy (601 FW 3). According to the New Hampshire Natural Heritage Bureau (2010), one record of the state-threatened Loesel's twayblade (*Liparis loeselii)*, or fen orchid, exists in association with the John Hay Refuge (Poole 2007), and may occur in these wetlands.

Under this alternative, we would continue to record locations of vernal pools as encountered. Any management actions required to promote forest health and/or public safety would seek to avoid any negative impacts, if possible, to these wetland habitats.

Strategies

Continue to:

- Record locations of vernal pools and wetland habitats as encountered during other routine Refuge management activities; avoid impacts to known or discovered wetlands.
- Encourage partners and volunteers to record observations when visiting the Refuge.

Accountability Measures

- Number of vernal pools.
- Number of species noted in association with vernal pools.

Objective 1.4 Riparian and In-stream Habitat

Continue to maintain the in-stream habitat and riparian corridor along the approximately 1,750 feet of Beech Brook on the Refuge for species identified as conservation priorities, including eastern brook trout (*Salvelinus fontinalis*), by the Eastern Brook Trout Joint Venture and NH Wildlife Action Plan.

Rationale

Originating on Sunset Hill, Beech Brook flows entirely through conserved forest land, including its final 1,750 feet through the Refuge, until discharging into Lake Sunapee, and is therefore subject to minimal human impact. Route 103A crosses over the brook between Forest Society property and the Refuge, and poses a threat to the brook through run-off and sedimentation. Stormwater runoff poses a risk to the entire lake as phosphorus levels continue to increase at nearshore and tributary monitoring stations (SAWC 2008). As one of the tributaries to Lake Sunapee, LSPA has monitored Beech Brook, upstream from the Refuge, as part of its volunteer monitoring program for 18 years, and it consistently has one of the lowest levels of phosphorus and conductivity on the lake, two measures of human impacts. In addition, due to its high water quality, it has been used as a reference stream for the lake (J. Fichter, pers. comm.).

The water quality of Beech Brook is exemplary in a region heavily influenced by human factors, and this is a critical resource for two fish species in particular, the eastern brook trout and rainbow smelt (*Osmerus mordax*). These two species are listed as species of greatest conservation need by the state, and the eastern brook trout is a species of regional conservation concern due to local extirpations and regional population declines (Hudy et al. 2005). In the Northeast, coastal and some inland populations of rainbow smelt were placed on the species of concern list by the National Marine Fisheries Service in 2004 due to population declines as well (http://www.nmfs.noaa.gov/pr/species/concern/#list). Rainbow smelt are a common prey species, supporting many sport fish and bird species, but both rainbow smelt and brook trout are considered game fish and are protected under the state's fishing regulations. Requiring clean, cold water, both species are found in Lake Sunapee, and are reported to spawn in Beech Brook, or along the shore at the mouth of Beech Brook (D. Anderson, pers. comm.).

It is evident that the good water quality of Beech Brook provides excellent habitat for both of these species, and aids in understanding human impacts on the lake. We would continue to rely on LSPA to monitor Beech Brook as part of their volunteer monitoring program and we would facilitate communication with them and our other partners should any new information arise. Any forest management actions required to maintain forest health or public safety would follow best management practices to minimize impacts on the water quality of Beech Brook.

Strategies

Continue to:

- Continue to rely on LSPA to monitor Beech Brook and collect water quality data.

Accountability Measures

- Measurements of water quality as taken and analyzed by LSPA.

Objective 1.5 Shoreline/Minute Island

Continue to protect the 3,100 feet of undeveloped Refuge shoreline along Lake Sunapee, and the 0.1 acre Minute Island by preventing public use activities that may pose risks to the biological integrity of these habitats.

Rationale

The Service and The Fells combined, own approximately three-quarters of a mile of contiguous, undeveloped, and relatively undisturbed shoreline on Lake Sunapee. The Service owns Minute Island as well, just offshore. These are uniquely natural features on a heavily residential and recreational lake, and provide an aesthetic quality to the Refuge that enhances the visitor experience. This undeveloped lakefront will have increasing importance as the area continues to grow in population and the housing and infrastructure to support it.

Minute Island: Barry Parrish/USFWS

The natural features of the town, including Lake Sunapee, will continue to draw in both year-round and summer residents as well as day-use visitors. Newbury has already seen some impressive population growth, increasing from 509 year-round residents in 1970 to 1,702 in 2000, at a rate of 4.1 percent annually (Newbury Planning Board 2007). This is in comparison to a growth rate of 1.8 percent in Merrimack County and 1.7 percent in the state during the same time period. In addition, the 2000 summer population was estimated at around 4,000 people. As the number of visitors and amount of lake-use increases, so will impacts to the lake and lakeshore.

The undeveloped shoreline also provides a benefit to a wide array of species. The mouth of Beech Brook and the stream itself serves as spawning habitat for rainbow smelt, and during brood rearing and migration waterfowl forage along the lakeshore. Human disturbance from near-shore watercraft, and unauthorized boat landings may pose risks to the habitat and we would retain the signs along the lakeshore regarding Refuge shoreline policy, and work with our local conservation partners and NH Marine Patrol to monitor shoreline use.

Strategies

Continue to:

- Maintain signs along the Refuge shoreline and Minute Island prohibiting boat landing on the Refuge.

Accountability Measures

- Number of feet of disturbed shoreline, and identification of the underlying cause of disturbance.
- Number of signs posted or maintained.
- Number of incidents reported.

Goal 2. Promote natural resource conservation, stewardship, the mission of the National Wildlife Refuge System and enjoyment of the John Hay Refuge by providing high-quality, compatible, wildlife-dependent public use opportunities on Refuge lands and neighboring conserved lands and waters.

Objective 2.1 Hunting

Maintain a year-round no-hunting policy on the Refuge over the next 15 years.

Rationale

The Improvement Act identifies hunting as a priority wildlife-dependent recreation and locally it is an established traditional resource use. Furthermore, hunting promotes public understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. The John Hay Refuge is a relatively recent addition to the Silvio O. Conte NFWR Complex, having been previously managed under the Great Bay NWR Complex, and the Eastern Massachusetts NWR Complex. Current staffing and funding levels at the Conte Complex have thus far prevented our ability to assess if it is feasible to provide, monitor, or enforce quality hunting opportunities on the Refuge. Historically, hunting has not been allowed on the Refuge, and the addition of a general hunting program has the potential to lead to user conflicts due to the small size of the Refuge and the interconnected trail system between The Fells and the Refuge, if not appropriately managed. This trail system loops through roughly half of the Refuge and is used by both visitors to The Fells as well as hikers. Hunting is allowed on Forest Society property across Route 103A, therefore there is adequate opportunity to enjoy this recreation in the local area. Under this alternative, we would continue to maintain our no-hunting policy.

Strategies

Continue to:

- Work with partners, especially NH FGD, to monitor and enforce when possible a no-hunting policy on Refuge property.

Accountability Measures

- Reports of illegal hunting.

Objective 2.2 Recreational Fishing

Maintain a year-round no-fishing policy on the Refuge over the next 15 years.

Rationale

The Improvement Act identifies fishing as priority wildlife-dependent recreation. It states, “Compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System.” As with hunting, we recognize fishing as a healthy, traditional outdoor pastime. It, too, promotes public understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. The John Hay Refuge is managed as a satellite station within the Silvio O. Conte NFWR Complex, and is a relatively recent addition to the Conte Complex, having been previously managed

under the Great Bay NWR Complex, and the Eastern Massachusetts NWR Complex. Current staffing and funding levels at the Conte Complex have thus far prevented our ability to assess if it is feasible to provide, monitor or enforce quality fishing opportunities on the Refuge. Historically, fishing has not been allowed on the Refuge, and under this alternative we would continue to maintain this no-fishing policy.

Strategies

Continue to:

- Work with partners to monitor and enforce when possible a no-fishing policy on Refuge property.

Accountability Measures

- Reports of illegal fishing.

Objective 2.3 Wildlife Observation and Photography

Maintain quality wildlife observation and photography opportunities throughout the approximately 80 acres of the Refuge over the next 15 years, especially along the 0.9 mile self-guided Ecology Trail.

Rationale

Wildlife observation and photography are two of the six wildlife-dependent priority public uses of the Refuge System that have received greater consideration since the 1997 Refuge Improvement Act. This Refuge offers a developed Ecology Trail and nearly 80 acres of mixed forest, riparian, and shoreline habitat that abound with scenic vistas and a diversity of wildlife. The Ecology Trail is a self-guided tour with a variety of numbered stations and a corresponding brochure providing opportunities to view some of the unique natural features of the Refuge. The rest of the Refuge offers relatively easy to moderate hiking conditions. We would continue to provide these opportunities for wildlife observation and photography.

Strategies

Continue to:

- Collaborate with partners on trail maintenance as needed.
- Provide materials (e.g., Ecology Trail self-guided interpretive flyer) for these activities.

Accountability Measures

- Number of participants walking on or off the Ecology Trail.

Objective 2.4 Environmental Education and Interpretation

Over the next 15 years, continue to maintain the existing interpretive signs and brochure, and to rely on strong partnerships with The Fells, Forest Society, and other partners to provide opportunities for interpretation and environmental education on the Refuge.

Rationale

Environmental education is a process designed to develop a citizenry that has the awareness, concern, knowledge, attitudes, skills, motivations, and commitment to work toward solutions of current environmental problems and the prevention of new ones. It is intended to address the audience's course of study, or curriculum, through directed materials, activities, programs, and products that also incorporate the Refuge's purpose and the mission of the National Wildlife Refuge System (605 FW 6). Interpretation, on the other hand, is defined by the National Association of Interpreters as a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource. This occurs through activities, talks, publications, signs, audio-visual media, and exhibits (605 FW 7). Both are included in the six wildlife-dependent public use priorities within the Refuge System, according to the Refuge Improvement Act of 1997. Opportunities are presently available for both of these activities on the Refuge and, despite the limitations due to Refuge staffing and funding, we believe we would continue to offer quality programs by partnering with The Fells, Forest Society, LSPA, NH FGD and others. The Fells Master Plan (The Fells 2006) includes environmental education as one of its goals, and we would continue to work with them in the spirit of an MOU.

Strategies

Continue to:

- Work with The Fells in the spirit of cooperation from the old MOU, and pursue an updated MOU.
- Maintain the interpretive stations along the Ecology Trail and provide the self-guided interpretive trail brochures.
- Offer the Refuge to partners offering outdoor environmental education.

Accountability Measures

- Number and type of educational programs using the Refuge.
- Number of participants using the Refuge.

Goal 3. Communicate and collaborate with local communities, federal and state agencies, The Fells, and conservation organizations throughout the Lake Sunapee region to promote natural resource conservation, stewardship and the mission of the National Wildlife Refuge System.

Objective 3.1 Partner and Community Outreach

Over the next 15 years, continue to work closely with The Fells to conduct outreach and meet with partners on an as-needed basis, or as important issues arise.

Rationale

We rely heavily upon our partnerships given our limitations in staff and funding. It is of utmost importance for us to reach out and collaborate with our conservation partners in the region, including The Fells, Forest Society, LSPA and others, and to continue to facilitate communication regarding Refuge management, local conservation issues, and potential cooperative opportunities. It is through these partners that we strive to develop an effective outreach program targeted at local communities and residents who may be unaware that a national wildlife refuge is nearby. Community outreach is one of the goals described in The Fells Master Plan (The Fells 2006), and we would continue to seek their assistance in the spirit of cooperation under an MOU. It is particularly important that local residents understand, appreciate, and support the National Wildlife Refuge System mission and the Refuge's unique contribution to that mission. We would continue to develop and strengthen these partnerships and to collaborate with them for outreach.

Strategies

Continue to:

- Work with The Fells and Forest Society and their outreach opportunities to reach a broader audience in the community.
- Meet with partners as needed at The Fells to maintain communication about maintenance, visitor services, administration and management of the Refuge.
- Work with The Fells in the spirit of cooperation from the old MOU, and pursue an updated MOU.

Accountability Measures

- Number of meetings with The Fells and other partners.
- MOU with The Fells completed within 2 years.
- Number and type of outreach efforts.

Objective 3.2 Outreach to Elected Officials

Over the next 15 years, inform elected officials about the Refuge purposes and management activities as important issues arise.

Rationale

Gaining support from federal, state and local elected officials is essential to meeting our goals. This can only happen when these elected officials are fully informed, and understand and appreciate the substantial

contribution of the Refuge to the Refuge System and the importance of federal trust resources in New Hampshire. The support of elected officials is integral for the continued funding and delivery of other resources necessary to achieve the goals and objectives of this plan. We would continue to work with our partners to keep elected officials informed as issues arise.

Strategies

Continue to:

- Keep federal, state, and town officials apprised of Refuge activities, as issues arise.

Accountability Measures

- Number of contacts with federal, state and town officials.

Objective 3.3 Intergovernmental Partnerships

Over the next 15 years, continue to communicate with federal, state, and local governmental agencies to fulfill mutual natural resource conservation goals as needed, or as important issues arise.

Rationale

Present staffing and funding levels underscore the importance of creating and maintaining working partnerships with other governmental agencies to achieve Refuge goals, and to share expertise and resources. We would continue to foster these partnerships, including with NH FGD, and facilitate communication regarding Refuge management, and conservation issues in the region, to enhance our ability to achieve these goals and objectives. The cumulative land and conservation efforts of the Refuge and its several key partners provide a substantial contribution to conservation in the region. New Hampshire Fish and Game, LSPA, Forest Society, and The Fells each provide an integral piece of the overall conservation delivery system in the Lake Sunapee region.

Strategies

Continue to:

- Keep governmental partners apprised of Refuge activities as needed.
- Coordinate with the local governments in the Lake Sunapee Region as issues arise.
- Coordinate with NH FGD on fish and wildlife management as issues arise.

Accountability Measures

- Number of contacts with governmental partners.

Alternative B. Enhanced Habitat Management and Visitor Services (Service-preferred Alternative)

Alternative B is the alternative our planning team recommends to our Regional Director for implementation. It includes an array of management actions that, in our professional judgment, work best towards achieving the Refuge's purpose, vision, and goals, and would make an important contribution to conserving Federal trust resources of concern in northern New England forests, and maintaining the cultural heritage of the area. It is the alternative that would most effectively address the key issues identified in Chapter 1. We believe it is reasonable, feasible, and practicable within the 15-year timeframe.

This alternative builds upon the strong foundation of the conservation partnerships in the area and the conserved forest landscape to provide coordinated ecological and recreational management on the Refuge. This alternative describes a slightly more active forest management and visitor services component than current management over the next 15 years, as our levels of funding and staffing permit. Under Alternative B, we would continue our adaptive management approach of modifying actions based on new information with a constant effort to collect more and better data upon which to make management decisions. Chapter 3 presents the types of Refuge habitat, in Table 3.5 and Map 3-2.

Habitat Management

Under this alternative, we would incorporate the principles of adaptive management, and specifically Strategic Habitat Conservation where possible, as habitat management is the primary tool in attaining population objectives under this framework. We would monitor the Refuge forest for change on a 10 to 15 year basis, conducting updated inventories and surveys, and use the principles of adaptive management to determine management actions, if any, at that time. We would incorporate a landscape-level approach in making management decisions to evaluate how the Refuge can complement landscape habitat diversity in compliance with the recommendations of regional conservation plans. Management actions would include relocating the Ecology Trail away from Beech Brook and/or installing a footbridge(s) at the stream crossing(s) to minimize negative ecological and water quality impacts. This would also address the safety issues associated with the current stream crossing, as it requires stepping across slippery rocks. We would also evaluate the need to mitigate impacts from human disturbances on the shoreline from near-shore rafting and unauthorized boat landings on the Refuge. As under Alternative A, we would continue to work with our partners to monitor forest health, water quality, visitor impacts and safety.

The meadow acreage would be increased in size to total approximately 3.0 (+/-) acres, by either expanding the existing meadow or creating a new one, if a review of historical documents, maps, and the recent habitat inventory indicate that meadow habitat can be increased without impacting the mature forest component of the Refuge. Historical land uses on the Refuge resulted in open grassy habitat due to farming and pasturing, and this effort would seek to recreate some of that habitat available to species dependent upon open lands. We would continue to mow and mechanically maintain the newly expanded meadow to accomplish the desired habitat condition.

Inventories and Monitoring

The Service would initiate monitoring and inventory efforts through existing Service programs and partnerships such as NH FGD, NH Audubon, LSPA, The Fells, and other organizations and volunteers to provide key information on federal trust resources commensurate with the necessary resources to accomplish them. We would target any alterations or additions to these ongoing surveys toward helping us better understand the implications of our management actions and ways to improve our efficiency and effectiveness. We would likely use habitat monitoring as a surrogate for evaluating the effects of our management on priority wildlife species. It is not feasible, considering the Refuge size, staffing and funding available for the Refuge, to monitor migratory bird populations on this 80-acre Refuge in a

statistically reliable way. We would also continue to seek ways to reduce our management costs for establishing and maintaining forest and grasslands.

Visitor Services

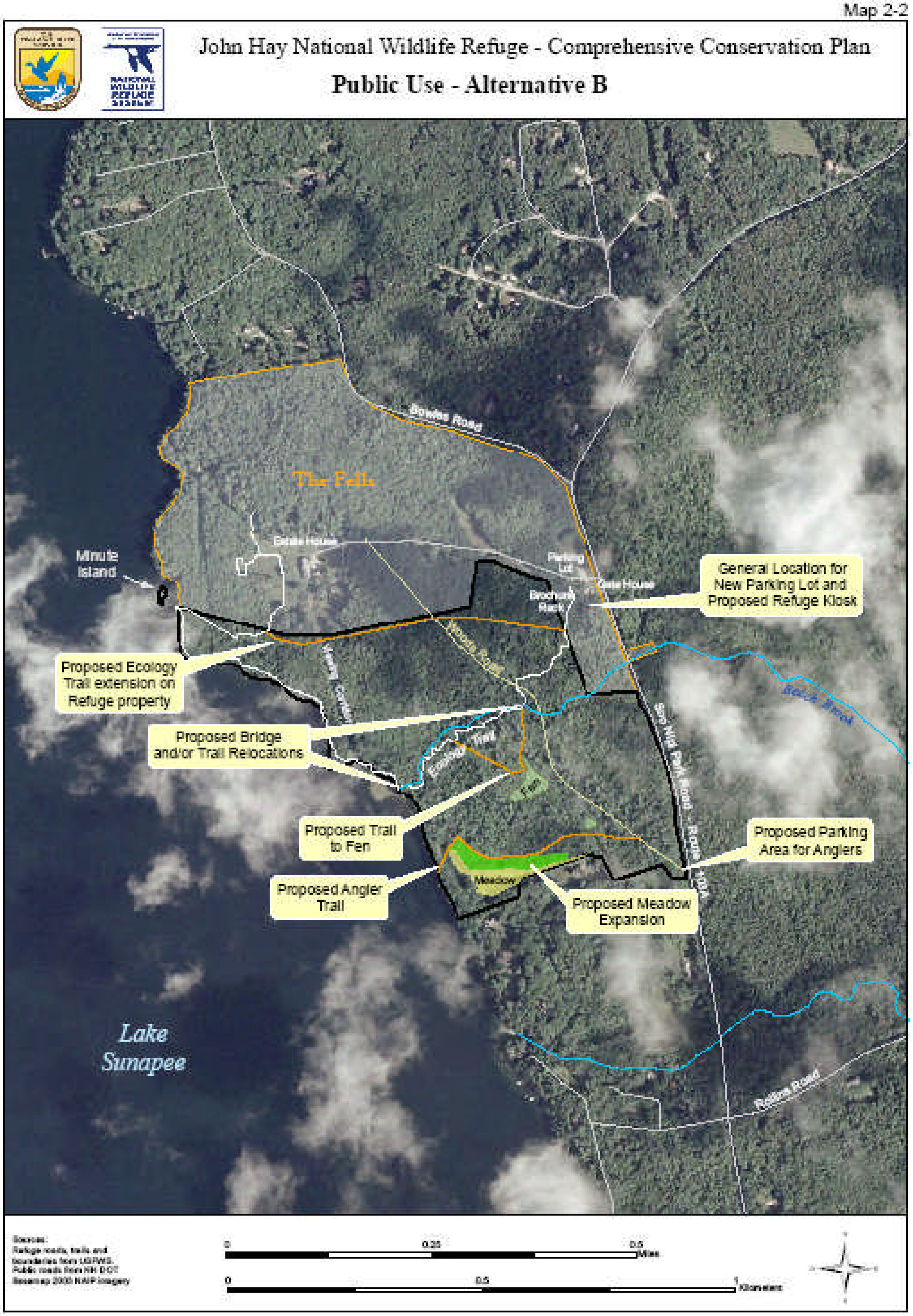
Under Alternative B, we would expand existing opportunities for the four priority public uses already allowed, and establish a limited fishing program on the Refuge. This would be evaluated simultaneously with the CCP/EA through compatibility and appropriateness assessments (Appendix B).

A seasonal visitor services specialist would be stationed at the Refuge during the summer, pending sufficient funds, allowing us to expand our visitor services program from what they would be under Alternative A. This would include designing Refuge brochures, conducting interpretive programs, providing on-site presence to help monitor public use, and continuing to work with our partners to provide quality visitor experiences. Stand-alone signs interpreting wildlife and habitats, along with signs about the Service, National Wildlife Refuge System, the Connecticut River Watershed, and other relevant themes would be installed along the trail and/or the new trailhead kiosk. Once The Fells has moved their parking lot to its new and final location, we would establish a trailhead for the Ecology Trail and build a Refuge informational kiosk there (Map 2-2).

The section(s) of the Refuge trail that crosses and parallels Beech Brook would be relocated and/or replaced by a footbridge(s) to protect the stream channel and banks and improve visitor safety. Two additions to the Ecology Trail and a new trail for anglers would be installed. All three would be primitive, native surface trails similar to the existing Ecology Trail. These additions would include adding a spur trail from the Ecology Trail to the nearest fen and back to provide additional opportunities for interpretation and wildlife observation and photography. The second addition would loop the Ecology Trail back to the trailhead on Refuge property for visitors not wishing to enter The Fells property. The angler trail would provide access to the Lake Sunapee shoreline from the proposed angler parking site on the southern end of the Woods Road. This parking area would serve as the point of entry for anglers, would have informational signage, and would be limited to a small number of cars. The Refuge gate would be moved if necessary from its present location to accommodate several cars, but would continue to prevent the use of motorized vehicles on the Refuge. Boundary signs would be posted on the Refuge shoreline, and sun-bleached or faded signs on the shore would be replaced to clarify Refuge shoreline policies.

In expanding opportunities for compatible outdoor recreational opportunities, we would hope to contribute to communities around the Refuge, both in terms of health and well-being, and economically. By offering places and programs where children and their parents can observe wildlife in natural settings, and actively participate through opportunities such as fishing, we would contribute to the growing national initiative to reconnect children with nature. Research has also shown that by offering places where visitors can enjoy watching birds and other wildlife, local economies benefit (http://training.fws.gov/library/Refuges/EconBen_refuges97.pdf) Benefits come in the form of increased sales by local businesses for food, lodging, fuel, and supplies and from associated tax revenues.

Map 2-2


John Hay National Wildlife Refuge - Comprehensive Conservation Plan
Public Use - Alternative B
Bowles Road
The Fells
Minute Island
Parking Lot
Gate House
Brochure Rack
General Location for New Parking Lot and Proposed Refuge Kiosk
Proposed Ecology Trail extension on Refuge property
Proposed Bridge and/or Trail Relocations
Proposed Trail to Fen
Proposed Angler Trail
Meadow
Proposed Meadow Expansion
Proposed Parking Area for Anglers
Lake Sunapee
Rollins Road
0
0.25
0.5
Miles
0
0.5
1
Kilometers

Refuge Administration

This alternative proposes that we achieve a level of staffing that reflects the size of the Refuge and public use levels by adding a seasonal staff position as described in RONS (Appendix D). This seasonal visitor services specialist would be hired during the summer months (approximately Memorial Day to Labor Day) to better achieve Refuge goals for improving visitor experience and expanding public use programs. The Service would work with The Fells to locate this position in the gatehouse, to minimize costs and enhance collaboration. We would work with them to enhance Service visibility through signs and brochures to create awareness of Service presence and to interpret ecological and cultural aspects of the property at the contact point as appropriate and as resources allow. This staff person could provide coordination among the Conte Complex and regional Service program staff and partners for any new surveys, inventories, research and monitoring efforts for priority resources that are initiated.

As in Alternative A, the MOU with The Fells would need to be updated and renewed to reflect our collaborative partnership and similar goals for natural resource stewardship. This includes the use of The Fells parking lot, which is currently located on the north side of the gatehouse. This agreement would still apply if The Fells completes their plan to move this parking lot to the south side of the gatehouse to accommodate a larger number of cars. Maintenance on the Refuge would include maintaining boundary and regulatory signs, posting interpretive signs as necessary, and maintaining the Ecology Trail and proposed trail additions. Refuge law enforcement presence would be scheduled on an as-needed basis.

We would base any increases in staffing on available, permanent sources of funding, and would consider them in the context of regional and Refuge Complex priorities.

In the discussion that follows, we describe in detail the goals, objectives, and strategies that we would implement under Alternative B.

Goal 1. Contribute to the biological diversity and integrity of the Atlantic northern forest in the larger context of the Lake Sunapee region and Connecticut River watershed by protecting, enhancing, and restoring the Refuge's habitats, with an emphasis on breeding, migrating, and wintering birds.

Objective 1.1 Forest Habitat

Over the next 15 years, allow natural processes (e.g., mortality, blow downs) to continue to shape the approximately 76 acres, assuming expansion of the existing meadow, of upland forest that may encourage natural regeneration and diversification of forest structure. This would benefit migratory and nesting birds of conservation concern in BCR 14 and NH WAP including, but not limited to, the Canada warbler and wood thrush. Any meadow expansion would not be at the expense of mature forest habitat.

Rationale

Transition hardwood-conifer forests, including the Refuge forest, are regionally common but important because they host a high proportion of the total population of many avian species of priority conservation concern. They mark the transition between central hardwood species to the south, and boreal forests to the north, and offer diverse species assemblages based on elevation, soil, and topographical characteristics. The Refuge forest is part of the Hemlock-Hardwood-Pine matrix forest as described by the NH WAP, and it is the most widely distributed forest type in the state of New Hampshire covering almost 50 percent of the state's land area (NH FGD 2005). Despite its abundance, it is listed as one of the state's most at-risk habitat types because of the threat of human development, and introduced species.

The suppression of natural disturbance regimes, such as fire, has resulted in a forest dominated by older age classes (NH FGD 2005), and a loss of diversity in species composition, and successional stages.

This lack of diversity in forest age and composition is cited by regional bird conservation plans, such as BCR 14 and PIF 27, to be a factor in the population declines of some high priority bird species. For example, the wood thrush, with 9.1 percent of its breeding population in BCR 14, has shown a steady decline of 2.49 percent per year between 1966 and 1999, and the Canada warbler, with 14 percent of its breeding population in BCR 14, has shown a decrease of 2.46 percent per year during the same time period (Dettmers [updated 2006]). Both of these species breed on the Refuge along with many other migratory species of regional conservation concern such as veery, yellow-bellied sapsucker, eastern wood-pewee, American redstart, and purple finch.

The Canada warbler breeds in a range of habitat types including deciduous forested swamps, cool, moist, mature forest or streams and swamps with dense undergrowth, streamside thickets, and cedar bogs (Conway 1999). Although shrub-scrub is an important habitat component over some of its range, it may be of lesser importance in the Northeast. It nests on or near the ground, generally near water. Suitable habitat often has a layer of moss and an uneven forest floor; however, they may be less common in shrub wetlands (Conway 1999). On the White Mountain National Forest in New Hampshire and Maine they occur in northern hardwoods with a softwood understory (DeGraaf and Yamasaki 2001). In central Maine, Collins (1983) found the Canada warbler in forests with a high percent shrub cover (70%), moderate canopy cover (64%), and minor component of conifers in the canopy. Hagan and Grove (1999) suggest the species is likely adapted to natural tree fall gaps, hence their positive response to forest management that creates dense deciduous understory with some overstory remaining. The wood thrush prefers mature, moist, closed-canopy forest with a shrub-subcanopy understory, moist soil, and leaf litter (DeGraaf and Yamasaki 2001).

Canada warbler: Paul J. Fusco

Overall conservation goals in BCR 14 are to increase the populations of both of these species by 50 percent. Habitat objectives for the BCR are a total of 29,417 hectares (approximately 72,660 acres) for Canada warbler at a density of 5.6 hectares (13.8 acres) per pair, and 502,273 hectares (1,240,614 acres) for wood thrush at a density of 5.0 hectares (12.4 acres) per pair (Dettmers [updated 2006]). For the wood thrush, population objectives under PIF 27 focus on stabilizing the current declining population

trend at a minimum, and maintaining 250,000 breeding pairs (Hodgman and Rosenberg 2000). For the Canada warbler, overall PIF 27 population objectives are to maintain 20,000 breeding pairs (one to two birds per breeding bird survey (BBS) route; Hodgman and Rosenberg 2000). Differences in the population estimates for the same species between these two regional conservation plans are due in large part to the differences in land area included in each ecoregion. Both plans use BBS survey data and provide rough approximations of population size.

PIF has also provided state-level population objectives for birds of conservation concern in relevant physiographic areas. For New Hampshire, recommended objectives are to increase the state wood thrush population from an estimated 160,000 individuals to 240,000 individuals (Rosenberg 2004). For the Canada warbler, Rosenberg (2004) recommends increasing the state population from an estimated 7,100 individuals to 11,000 individuals.

Limitations in Refuge resources and staff availability result in a lack of surveys and monitoring to adequately assess Refuge bird population densities and trend data, and this would likely remain unchanged in this alternative. However, the Service has the responsibility for protecting migratory birds under international migratory bird treaties with Mexico and Canada, and to uphold the establishing purpose of the Refuge as a wildlife and migratory bird reservation. In fulfilling these mandates, the Refuge would strive to provide quality, mature forest habitat and to consider the needs of birds of conservation concern on a sub-regional or statewide scale according to the NH WAP, BCR 14, and PIF 27 conservation plans.

Furthermore, due to the fact that many northern hardwood forest-dependent species, including Canada warbler, respond positively to silvicultural practices, we open up the possibility to conduct more active forest management as needs arise and as staff availability and resources allow under this alternative. By continuously evaluating the forest on a 10 to 15 year basis, and using the principles of adaptive management, we would be able to determine forest management priorities and actions to potentially promote suitable habitat for these and other species of conservation concern. This recurring forest inventory would also serve the dual purpose of creating baseline data and subsequent monitoring for potential changes due to climate change (e.g., cumulative factors including forest species composition, forest health, and exotic invasive species). Due to the size of the Refuge, it may be most effective to take a landscape level approach and tailor our forest management to habitat conditions in the region. We would continue to work with our partners, including Forest Society and state agencies (including NH FGD), to identify regional needs and appropriate management actions.

In addition to its regional importance, the current character of the Refuge forest is locally unique. Though predominately a result of old field regeneration, the forest is a mix of age classes and structural complexity that provide a diversity of wildlife habitat. Large, legacy white pines found on the southern end of the property are remnants of second-growth forests that germinated during the post-farm abandonment era in the mid-1800's. The hurricane of 1938 had a profound impact on New England, and locally reset forest stands that are now approximately 70 years old. Regeneration following other natural mortality events such as blow downs due to heavy winds and ice storms, and insects and disease has created within-stand age diversity. These features in combination with the location of the Refuge on the lake highlight its cultural and biological importance and we would continue to take this into consideration as a part of any forest management activities. Should a disturbance event such as a windstorm or wildfire reset a portion or all of the mature forest, the Refuge would likely allow habitat to recover through natural succession. We would, however, continue to work with our partners to monitor forest health and to determine appropriate responses to ice storms, heavy winds and other natural events that may alter the forest character.

There is an existing viewing corridor that runs slightly southeast from the Hay's main house, through the Refuge, to the lake. As a result of the land exchange, The Fells now have an easement that allows them to maintain it over time as a cultural resource. From a habitat standpoint this corridor functions as early successional forest habitat, important for species such as chestnut-sided warblers. We would work with The Fells to identify a treatment schedule that meets their needs while contributing beneficial diversity on the Refuge.

Strategies

Continue to:

- Eliminate trees that present safety hazards as needed where brought to the attention of the Service. These would be trees that have fallen or are leaning over the trail or other key visitor use areas to maintain safety and access. Hazard trees would be dropped and left in place to serve as coarse woody debris used as foraging sites and cover by wildlife, and to replenish soil nutrients. On other areas of the Refuge, dead or dying trees would be left as part of the natural landscape.
- Respond to natural events that change forest structure, such as ice storm and wind damage to address safety and viewshed concerns (e.g., if a big windstorm left broken and toppled trees throughout sections of the Refuge forest, we would consider initiating salvage operations to clean up some of the debris, depending on the extent and severity of damage).
- Treat for disease and insect outbreaks as needed by working with state and local partners to prevent excessive losses on the Refuge or from affecting adjacent lands.

Within 1 year of CCP approval:

- Complete and implement an HMP within one year of CCP approval.

Within 5 years of CCP approval:

- Work with The Fells to develop a treatment schedule for the viewing easement within the new Memorandum of Understanding that incorporates both scenic and wildlife habitat objectives.
- Develop rapid response protocols with partners to quickly detect and address invasive plant species, disease and insect outbreaks, and blow down events due to wind, ice and other natural occurrences.

Within 15 years of CCP approval:

- Initiate forest inventories on a 10 to 15 year recurring basis that would serve the dual purpose of establishing baseline information as well as a systematic method to detect potential impacts associated with climate change over time.
- Collaborate with partners including NH Audubon and NH FGD to conduct bird species inventories every 10 to 15 years to monitor species presence over time.
- Ensure that Refuge habitat complements the larger landscape composition and structure for priority species.

Accountability Measures

- Forest acreage by stand composition and structure, based on the forest inventory from 2008.
- Number of acres impacted by natural processes and the resultant compositional and structural changes.

Objective 1.2 Meadow Habitat

Within five years, if suitable sites are located, expand the current meadow up to a total of 3.0 (+/-) acres, depending on habitat and historical factors, to support species of conservation concern. This would include American woodcock and other migratory and breeding species dependent upon meadow for habitat. Suitable sites would have site conditions suitable for meadow establishment and be generally devoid of large trees. Any meadow expansion would not be at the expense of mature forest habitat.

Rationale

Historically, fields and other open lands were maintained through natural processes such as fire, extreme weather events, herbivory, and beaver activity (NH FGD 2005). Native Americans created and maintained localized grassy areas through the regular use of fire, and early European settlers created openings through timber and firewood harvesting, agriculture, and controlled burning (see Chapter 3). By the mid-1800's, there was 2,248,659 acres of grassland throughout New Hampshire. Today, after the abandonment of farms, the suppression of natural events including fire, and the reversion of much of the land back to forest, there is approximately 252,047 acres of grassland in the state, and much of that is too intensively worked to be suitable for wildlife (NH FGD 2005).

Meadows are important to a number of species for breeding and foraging. In New Hampshire, these include reptile species such as the wood turtle and black racer (*Coluber c. constrictor*), a host of invertebrate species, and avian species including the American woodcock. A complete species inventory is needed for the Refuge, but American woodcock do use the existing meadow and have been documented on the Refuge during the breeding season.

Listed as a priority species of conservation concern in both BCR 14 and PIF 27, and as SGCN in New Hampshire, the American woodcock is facing declines range-wide due to habitat loss and degradation. Woodcock require several different habitat conditions that must be in close proximity to one another. These include clearings for their well-known courtship displays to attract females (singing grounds), large openings for night roosting, young second growth hardwoods (15 to 30 years) for nesting and brood-rearing and functional foraging areas (Sepik et al. 1981; Keppie and Whiting 1994). Research has shown that the quality of woodcock singing grounds are tied to the proximity of openings to forested habitats with a high density of understory vegetation that provides adequate cover for nesting and brood-rearing (Kelley et al. (eds) 2008). Functional foraging habitat for woodcock occurs on moist, rich soil dominated by dense shrub cover (75-90%); alder is ideal, although young aspen and birch are also suitable as feeding areas and daytime (diurnal) cover. Open meadow and early successional forest are two habitat types that are declining in New England.

Singing ground surveys for American woodcock have taken place throughout their range annually since the early 1970's. Over that period of time, these surveys have shown a steady decline of 1.9 percent per year in the eastern portion of their range. In addition, the national Wing-collection Survey, a collection of woodcock wings submitted by hunters that provides a ratio of immature birds per adult female in the harvest, has shown that recruitment is declining as well (Kelley et al. (eds) 2008).

In New Hampshire, American woodcock are distributed throughout the state, with the highest concentrations found in the west-central and southeast regions. Singing ground surveys (SGSs) have shown American woodcock numbers to be stable statewide (NH FGD 2005), however, BBS data show a regional decline of 6.37 percent per year (Dettmers [updated 2006]). The current estimate of singing male woodcock is approximately 13,255 in New Hampshire (Kelley et al. (eds) 2008).

According to the American Woodcock Conservation Plan (Kelley et al. (eds) 2008), overall conservation objectives for woodcock are to: (1) halt woodcock population declines by 2012 as measured by SGSs, (2) achieve positive population growth by 2022 as measured by SGSs, (3) halt decline of early succession habitat by 2012 as measured by the Forest Inventory Analysis system (FIA), and, (4) increase early succession habitat by 2022 as measured by the FIA. Many of the regional conservation plans advocate maintaining representative tracts of different forest habitat types throughout the landscape, providing a mosaic of available habitat for a number of different species requirements (Dettmers [updated 2006], Hodgman and Rosenberg 2000). In addition, the American Woodcock Conservation Plan (Kelley et al. (eds) 2008) advocates a mix of early successional habitat types that will provide adequate resources for the various requirements of this species. They estimated the amount of habitat needed in BCR 14 to re-establish former woodcock densities, and in New Hampshire, this totals approximately 269,000 acres (Kelley et al. (eds) 2008).

The location and history of the Refuge reflect land use changes throughout northern New England. Once cleared for farmland, it has slowly reverted back to forest, and today is primarily a mix of mature upland hardwood, white pine, and hemlock (*Tsuga canadensis*) species. Only 1.4 acres of meadow remains on the Refuge. We would evaluate the Refuge in terms of historic levels of fields and other open land and potential effects to the existing mature forest habitat to determine whether we would increase the existing meadow acreage to benefit breeding woodcock on the Refuge, and other species that require meadow habitat. Our intent would be to avoid deleteriously impacting the mature forest component of the Refuge in creating this meadow. In addition, using our recently completed forest habitat inventory as a baseline, and evaluating the forest on a 10 to 15 year recurring basis, it may be possible to incorporate woodcock habitat recommendations as needed for nesting and brood rearing habitat in proximity to the existing or potentially expanded meadow. We would also work with our conservation partners to take a landscape level approach to early succession habitat management and evaluate conservation needs in a larger context.

Strategies

Continue to:

- Use mechanical treatments (e.g., mowing) once every two years after September 15th or as conditions warrant to retain a primarily herbaceous composition.

Within 5 years of CCP approval:

- Identify partnership opportunities to mow the field.
- Review historical records, maps, and stone walls, as well as the habitat inventory, to help determine whether there is an appropriate place to expand meadow acreage on the Refuge.

Within 15 years of CCP approval:

- Collaborate with partners including NH Audubon and NH FGD to conduct bird species inventories every 10 to 15 years to monitor species presence over time.

Accountability Measures

- Number of meadow acres.
- Frequency of treatments.

Objective 1.3. Wetlands Habitat

Over the next 15 years, protect and monitor Refuge wetlands for the benefit of amphibians and reptiles by completing at least one vernal pool species breeding survey within the next 15 years. In addition, continue to allow natural processes to influence fens, vernal pools and other wetland habitats on the Refuge that may provide important breeding and foraging habitat for amphibians and reptiles of conservation concern identified in the NH Wildlife Action Plan, NE PARC, and other regional plans, such as spotted salamander.

Rationale

Wetland habitat on the Refuge includes two fens that total approximately one acre, and one vernal pool. These wetland communities are small, but no less important to many plants and animals of conservation concern. Vernal pools were categorized as one of the most at-risk habitat types in New Hampshire (NH FGD 2005). Though found statewide, they have no regulatory protection, are not well documented, and are therefore often overlooked during development projects. Oftentimes they are filled in or otherwise lost.

Vernal pools play a vital role in the life cycles of certain, sometimes rare, species. They are slight depressions in the ground that hold water for a period of time in the spring and summer before eventually drying out. A suite of species must lay their eggs in these ephemeral pools of water. The eventual drying of these pools during the growing season prevents predatory fish from becoming established. Vernal pool-obligate species include the spotted salamander, blue-spotted salamander, wood frog, and fairy shrimp. Other species, including Blanding's (*Emydoidea blandingii*) and spotted turtles (*Clemmys guttata*), use vernal pools for foraging and as staging areas for migration (NH FGD 2005).

The Refuge lacks adequate data to say with certainty the number of vernal pools on the Refuge, or what species they support. The one vernal pool documented thus far gave some indication that it may have been a result of human modification of the landscape (LaPointe 2008). More information on the hydroperiod and the presence of vernal pool-obligate species is needed to see what ecological role it serves on the Refuge. In addition, a more complete inventory of vernal pools throughout the Refuge needs to be conducted, though the soil types and topography indicate there may not be many more (LaPointe 2008).

In carrying out this objective, we would try to fill these knowledge gaps by conducting a thorough inventory of vernal pools on the Refuge, and georeferencing the location of any found. We would conduct at least one breeding species survey to evaluate the quality of the vernal pool(s) by the species utilizing them. We would work with the NH FGD to comply with state survey and reporting standards.

Fens, a type of peatland, are perennial wetland systems with a limited supply of ground and surface water that slowly decay organic matter over time resulting in a buildup of peat. They are similar to bogs in that they help to improve water quality, prevent flooding, and play a role in nitrogen and carbon cycling, but are generally less acidic, and support a more diverse animal and plant community because they have higher nutrient levels.

Often characterized by sedges, grasses, and wildflowers, they can support rare plant and animal species specifically adapted to the nutrient levels and pH conditions. According to the New Hampshire Natural Heritage Bureau (2010), there is one record of the state-threatened Loesel's twayblade, or fen orchid, associated with the John Hay NWR, and this species could very well be found in these habitats. A more thorough inventory needs to be conducted of these fens. Peatlands can be very diverse, and New Hampshire marks a transitional boundary between southern and northern fen habitat types. More information is needed about the type of fens on the Refuge and any at-risk species they support. As staff availability and resources allow, we would attempt to address these data needs.

Threats to these wetland communities include any activities that could alter the hydrology by changing water flow, or soil moisture holding capacity. In addition, any plant and animal species that depend upon fens for a part of their life cycle require intact surrounding upland habitat to protect the integrity of the wetlands, and for certain herpetofauna, to aid in dispersal. These factors would be taken into consideration for any forest management activities or meadow enhancements proposed on the Refuge. More information is needed regarding the impacts of road run-off, if any, given the distance between the wetlands and Route 103A.

Strategies

Continue to:

- Monitor to ensure that management activities including trail relocation do not adversely impact the fens.

Within 3 years of CCP approval:

- Inventory and georeference vernal pools on the Refuge, before any trail enhancement or habitat management is implemented.

Within 5 years of CCP approval:

- Coordinate with NH FGD for survey protocols and data submission to the NH FGD vernal pool database, and Reptile and Amphibian Reporting Program.

Within 10 years of CCP approval:

- Record the presence/absence of vernal pool-obligate species according to acceptable survey protocols.

Accountability Measures

- Number of vernal pool surveys.
- Number of vernal pools and fens on the Refuge.
- Number of species associated with vernal pools and fens.
- Total acreage of wetland habitats on the Refuge.

Objective 1.4 Riparian and In-stream Habitat

Within 5 years, evaluate the quality of the in-stream habitat and riparian corridor along approximately 1,750 feet of Beech Brook for species identified as conservation priorities, including eastern brook trout, by the Brook Trout Joint Venture and NH WAP plans.

Rationale

Originating on Sunset Hill, Beech Brook flows entirely through conserved forest land until it discharges into Lake Sunapee from the Refuge, and is therefore subject to minimal human impact. Route 103A, acting as the boundary between Forest Society property and the Refuge, crosses over the brook and poses a threat to it through run-off and sedimentation. Stormwater runoff poses a risk to the entire lake as phosphorus levels continue to increase at nearshore and tributary monitoring stations (SAWC 2008). As one of the tributaries to Lake Sunapee, LSPA has monitored Beech Brook, upstream from the Refuge, as part of its Volunteer Lake Assessment Program (VLAP) program for 18 years, and it consistently has one of the lowest levels of phosphorus and conductivity on the lake, two measures of human impacts. In addition, due to its high water quality, it has been used as the biological control for the lake (J. Fichter, pers. comm.). In addition, Beech Brook is reported to serve as an important migratory corridor for wildlife including black bear (*Ursus americanus*), mink (*Mustela vison*), otter (*Lutra canadensis*), and fisher (*Martes pennanti*; D. Anderson, pers. comm.).

The water quality of Beech Brook is exemplary in a region heavily influenced by human factors, and it has habitat characteristics that could support a native brook trout population. This trout is listed as SGCN by the state, and is also a species of regional conservation concern due to regional declines and local extirpations throughout its native range. According to the Eastern Brook Trout Joint Venture, most of New Hampshire has only qualitative data, but the state is one of a few with intact, self-sustaining wild brook trout populations (Trout Unlimited 2006). Though Beech Brook has not yet been surveyed by the New Hampshire Fish and Game, anecdotal information does indicate the presence of brook trout in Beech Brook (D. Anderson, pers. comm.). Other tributaries to Lake Sunapee have been found to contain self-sustaining brook trout populations in surveys conducted by the NH FGD (C. Bridges, pers. comm.). Whether or not this can definitively be said for Beech Brook needs to be determined before any further actions can be determined, and this would be accomplished under this alternative through stream surveys in cooperation with our partners in the NH FGD.

Rainbow smelt is another species associated with Beech Brook. An important forage base for many species, including land-locked salmon and lake trout, rainbow smelt are listed as SGCN in New Hampshire (NH FGD 2005). They are present in Lake Sunapee, and use the mouth of Beech Brook as a spawning area.

It is evident that the good water quality of Beech Brook provides excellent fish habitat on the Refuge and aids in understanding human impacts on the lake. We would strive to maintain these qualities under any management action. We would continue to rely on LSPA to monitor Beech Brook as part of their VLAP program, in particular for impacts due to acid deposition and increases in phosphorus from stormwater

runoff. This continued water quality monitoring in addition to a stream survey would also serve the dual purpose of creating baseline data and subsequent monitoring for potential changes due to climate change or other anthropogenic-induced impacts (e.g., cumulative factors including species composition, water temperature, presence and levels of biological and chemical parameters, as well as exotic invasive species). Any forest management actions required to maintain forest health or public safety would follow best management practices to minimize impacts on the water quality of Beech Brook.

Strategies

Continue to:

- Continue to rely on LSPA to monitor Beech Brook and collect water quality data.

Within 1 year of CCP approval:

- Post the area around the mouth of Beech Brook as closed to the beaching of boats.

Within 5 years of CCP approval:

- Relocate the Refuge's nature trail away from sensitive riparian areas and/or replace existing crossings with a footbridge(s) if it is found to negatively affect stream health.
- Assess the impacts of rafting, and other public use on the biological health and integrity of Beech Brook and manage to mitigate those impacts.
- Work with partners to assess the impacts of winter road treatments on the biological health and integrity of Beech Brook and mitigate any negative impacts.

Within 10 years of CCP approval:

- Partner with NH FGD to:
    - Conduct a baseline survey of in-stream habitats and fish;
    - Assess brook trout population structure;
    - Identify key habitats for brook trout.

Accountability Measures

- Brook trout population structure.
- Fish species richness of Beech Brook.
- Quality of brook trout habitat.
- Measurements of water quality.

Objective 1.5 Shoreline/Minute Island

Continue to protect the 3,100 feet of undeveloped Refuge shoreline and 0.1 acres of Minute Island by preventing public use activities that may pose threats to the biological integrity of these habitats.

Rationale

The Refuge and The Fells combined, own approximately three quarters of a mile of contiguous, undeveloped, relatively undisturbed shoreline on Lake Sunapee, and the Refuge owns Minute Island as well, just offshore. Nearing its northernmost distribution, a stand of black gum (*Nyssa sylvatica*) exists along the shoreline. These are uniquely natural features on the heavily residential and recreational lake, providing an aesthetic quality to the Refuge that enhances visitor experience. This undeveloped lakefront will have increasing importance as the area continues to grow in population and the housing and other infrastructure to support it.

Black gum bark: Ben Kimball

The natural features of the town, including Lake Sunapee, will continue to draw both year-round and summer residents as well as day-use visitors. Newbury has already seen some impressive population growth, increasing from 509 year-round residents in 1970 to 1,702 in 2000, at a rate of 4.1 percent annually (Newbury Planning Board 2007). This is in comparison to a growth rate of 1.8 percent in Merrimack County and 1.7 percent in the state during the same time period. In addition, the 2000 summer population was estimated around 4,000 people. As the number of visitors and associated lake-use increases, so will impacts to the lake and shoreline.

The undeveloped shoreline habitat provides a benefit to a wide array of species. The mouth of Beech Brook serves as a congregation area for spawning rainbow smelt, and waterfowl and wading birds use the habitat for cover and forage. More information is needed to assess habitat condition along the shoreline and we would make that a priority under this alternative. With this baseline data, we would be able to evaluate any negative impacts from the practice of rafting watercraft offshore and associated increases in shoreline use, or from unauthorized boat landings. Any restoration needs would be determined as well. In addition, baseline data and subsequent monitoring of the shoreline could provide valuable data to assessing impacts associated with climate change over time. We would continue to post signs reflecting shoreline policy and work with our local conservation partners and NH Marine Patrol to monitor shoreline use.

Strategies

Continue to:

- Maintain signs to prohibit boat landing on the Refuge shoreline or Minute Island.
- Deploy law enforcement officers to patrol the Refuge on select high-use days.
- Work with NH Marine Patrol to monitor and enforce posted Refuge signs.

Within 1 year of CCP approval:

- Install signs closing the Refuge shoreline and Minute Island to all rafting, beaching of boats, and public access from the lake to minimize adverse impacts to the undeveloped shoreline and nearshore habitats.

Within 3 years of CCP approval:

- Hire a seasonal Visitor Services Specialist who will help monitor for shoreline policy compliance and shoreline condition from approximately Memorial Day to Labor Day.
- Increase awareness of Refuge boat landing policies by conducting outreach with town and local marina's by posting flyers.
- Assess baseline shore condition and evaluate the need for restoration.

Within 5 years of CCP approval:

- Evaluate the impacts, if any, of rafting/beaching water craft on the Refuge.

Accountability Measures

- Feet of disturbed shoreline and the underlying cause.
- Number of days law enforcement officers deployed to Refuge.
- Number of incidents reported.
- Number of signs posted or maintained.

Goal 2. Promote natural resource conservation, stewardship, the mission of the National Wildlife Refuge System and enjoyment of the John Hay Refuge by providing high-quality, compatible, wildlife-dependent public use opportunities on Refuge lands and neighboring conserved lands and waters.

Objective 2.1 Hunting

Maintain a year-round no-hunting policy on the Refuge over the next 15 years.

Rationale

Same as Alternative A, Objective 2.1.

Strategies

Continue to:

- Work with partners to monitor and enforce a no-hunting policy on Refuge property.
- Assign notifications of violation to a Refuge Law Enforcement Officer.

Within 3 years of CCP approval:

- Work closely with partners to make Refuge visitors aware that hunting is allowed on Forest Society property and other areas in the region.

Accountability Measures

- Same as Alternative A, Objective 2.1.

Objective 2.2 Recreational Fishing

Within two years of CCP approval, open the Refuge to sport fishing.

Rationale

As discussed in Alternative A, the Improvement Act identifies fishing as priority wildlife-dependent public use. The act states, "compatible wildlife-dependent recreation is a legitimate and appropriate general public use of the System." Fishing promotes public understanding and appreciation of natural resources and their management on all lands and waters in the Refuge System. As stated under Alternative A, the recent addition of the John Hay Refuge to the Silvio O. Conte NFWR Complex, and our current staffing and funding levels have precluded our ability to consider the feasibility of fishing on the Refuge. We have utilized this CCP/EA as our opportunity to assess the feasibility of fishing on the Refuge (see Appendix B for the compatibility determination), and believe that with the cooperation of partners, including the NH FGD, a limited fishing program would be possible. Fishing at the Refuge would occur along Beech Brook and the Lake Sunapee shoreline.

Angler access would be restricted to the southeast corner where the Woods Road meets Route 103A. They would be allowed to park on a short section of the Woods Road that would accommodate several vehicles. The placement of the current gate may or may not be adjusted, depending on the space available at present; however, in either case, motorized access to the Refuge would continue to be restricted beyond this parking area. Informational signs regarding fishing on the Refuge would be posted in this small parking area. A new primitive foot trail would connect this parking area with the Lake Sunapee shoreline. Because of the heavy vegetation along the shoreline, it is anticipated that most fishing would be conducted from the lake waters, and therefore shoreline condition is not expected to be heavily impacted. Anglers would not be allowed to park in the parking lot adjacent to The Fells gatehouse, and signs would be posted to this effect.

Brook trout: Duane Raver/USFWS

Fishing from the lake would be under the jurisdiction of the state, and all fishing on the Refuge would follow state guidelines. Pursuant to the policies in 605 FW 3, we follow these guiding principles for fishing opportunities at the Refuge.

1. Effectively maintain healthy and diverse fish communities and aquatic ecosystems through the use of scientific management techniques;

2. Promote visitor understanding of, and increase visitor appreciation for, America's natural resources;

3. Provide opportunities for quality recreational and educational experiences consistent with criteria describing quality found in 605 FW 1.6;

4. Encourage participation in this tradition deeply rooted in America's natural heritage and conservation history; and

5. Minimize conflicts with visitors participating in other compatible wildlife-dependent recreational activities.

A limited fishing program of this scale should have little effect on the shoreline condition, as few anglers would be encouraged to park at any given time, a specific access point would be provided, and the heavy vegetation along the shoreline would likely necessitate that angling take place from the waters of Lake Sunapee. In addition, seasonal staff would be stationed on the Refuge and would provide on-site presence and oversight.

Strategies

Continue to:

- Monitor public use impacts to habitats associated with the angler trail once established.

Within 2 years of CCP approval:

- Coordinate with NH FGD, The Fells, local government officials, local conservation organizations, and the public to establish a fishing program.
- Establish a primitive foot trail from the angler parking area to the Lake Sunapee shoreline.
- Convert the southern-most section of the Woods Road into a limited parking area for anglers.
- Install a gate to restrict vehicular access beyond the parking area.
- Install signs at the angler parking area explaining that it is the angler point of entry.
- Install signs at The Fells parking lot that explains that angler parking is not allowed.

Accountability Measures

- Number of angler-use days.

Objective 2.3 Wildlife Observation and Photography

Enhance quality wildlife observation and photography opportunities throughout the approximately 80 acres of the Refuge over the next 15 years by implementing trail improvements. These would include considerations for increasing public safety, minimizing adverse impacts to sensitive habitats, and providing greater access to the diversity of Refuge habitats, including one of the fens.

Rationale

Wildlife observation and photography are identified in the Refuge Improvement Act as priority public uses. Priority public uses are to receive enhanced consideration when developing goals and objectives for Refuges. Providing high quality opportunities (as defined in 605 FW 1.6) for the public to engage in these activities on the Refuge promotes visitor appreciation and support for programs.

Pursuant to the policies in 605 FW 4 and 5, we follow these guiding principles for wildlife observation and photography opportunities at the Refuge.

1. Provide safe, enjoyable, and accessible wildlife viewing and photography opportunities and facilities.

2. Promote visitor understanding of, and increase visitor appreciation for, America's natural resources.

3. Focus on providing quality recreational and educational opportunities, rather than quantity, consistent with Service criteria describing quality found in 605 FW 1 Part 1.10.

4. Minimize conflicts with visitors participating in other compatible, wildlife-dependent recreation.

Quality wildlife observation and photography opportunities are currently available on the Refuge. Under this alternative, additional opportunities would be provided through the creation of a Refuge brochure and/or fact sheets highlighting common wildlife and habitat. The existing crossings of the Ecology Trail at Beech Brook are affecting channel integrity and the slick footing presents a safety hazard to visitors. This would be addressed by installing a footbridge(s). The Ecology Trail would still highlight Refuge natural features and wildlife, and additional interpretive signs would be installed along the trail to describe other Refuge resources and ecological processes.

The Ecology Trail currently ends near the main house on The Fells property. Typically visitors return to the parking lot via the long estate driveway. This poses an administrative problem because The Fells charges an admission fee to enter their property. We would work with The Fells staff to design an alternative route back to the parking lot that stays within Refuge boundaries, and would monitor any impacts from public use on habitats associated with this trail.

We would continue to work with The Fells, Forest Society and LSPA and others to promote enjoyment and awareness of Refuge wildlife and habitats and those of adjacent conservation lands.

Strategies

Continue to:

- Maintain boundary signs.
- Monitor public use impacts to habitats associated with the Ecology Trail and trail additions.

Within 1 year of CCP approval:

- Create an alternative route extending the current Ecology Trail back to the trailhead within the Refuge boundary to provide an option for hikers who do not want to cross over onto The Fells property.

Within 2 years of CCP approval:

- Continue to authorize partners including The Fells through a new Memorandum of Understanding to maintain the trail as needed for safety.

Within 5 years of CCP approval:

- Relocate the trail away from sensitive habitats, including in-stream habitat, and to take advantage of wildlife/habitat observation opportunities.
- Install footbridges or some other improvement at stream crossings to promote public safety and environmental stewardship.
- Install interpretive signs along the trail that describe the wildlife, fish, plants and habitats, the Service, National Wildlife Refuge System, the Connecticut River Watershed, and the Refuge.
- Coordinate with The Fells, Forest Society, and NH Audubon and others to increase awareness of, and opportunities to experience, the diversity of habitats and associated wildlife observation experiences on the Refuge and adjacent conservation lands.

Within 10 years of CCP approval:

- Develop a trail extension from the Ecology Trail to one of the fens and back, with the addition of interpretive panels to provide information about the ecological role of fens.
- Install a kiosk and provide associated interpretive panels and a fact sheet listing common wildlife species and habitats in The Fells new parking lot. Should construction for The Fells proposed parking area take longer than 10 years, we would endeavor to install the kiosk and associated materials within two years of completion of the parking area.

Accountability Measures

- Number of participants using the Refuge.
- Number and type of interpretive signs installed.
- Length of the Ecology Trail that is relocated.
- Length of boundary line maintained.

Objective 2.4 Environmental Education and Interpretation

Over the next 15 years, conduct interpretive and environmental education programs and create informational materials that cumulatively reach 50 percent of the total visitors to The Fells between Memorial Day and Labor Day.

Rationale

Environmental education is a process designed to develop a citizenry that has the awareness, concern, knowledge, attitudes, skills, motivations, and commitment to work toward solutions of current environmental problems and the prevention of new ones. It is intended to address the audience's course of study, or curriculum, through directed materials, activities, programs, and products that also incorporate the Refuge's purpose and the mission of the National Wildlife Refuge System (605 FW 6). Interpretation is defined by the National Association of Interpreters as a communication process that forges emotional and intellectual connections between the interests of the audience and the inherent meanings in the resource. This occurs through activities, talks, publications, signs, audio-visual media,

and exhibits (605 FW 7). Both are included in the six wildlife-dependent public use priorities within the Refuge System, according to the Refuge Improvement Act of 1997. Providing high quality environmental education and interpretation opportunities for the public on a refuge can: promote stewardship of natural resources; develop an understanding of the Refuge's purposes and the mission of the National Wildlife Refuge System; and, help raise awareness, understanding, and an appreciation of the role of the Refuge in northern New England forests and its contribution to migratory bird conservation. It also can garner support for other Refuge programs.

The addition of a seasonal visitor services specialist under this alternative would enhance our ability to provide additional interpretive programs and materials. The priority for this position would be to increase the level of interpretation programming on the Refuge to provide greater opportunities for the public to learn about the Refuge's resources. Working with The Fells provides an opportunity to reach an audience not necessarily aware of the Refuge, its role in the Refuge System, or how it contributes to regional resource conservation and we would continue to partner with them to broaden our audience. The visitor services specialist would also continue to partner with The Fells, Forest Society, LSPA, NH FGD and others to continue to provide a diversity of quality programs on the Refuge. The Fells Master Plan (The Fells 2006) includes environmental education in their goals, and we would continue to work with them in the spirit of an MOU. New interpretive signs would be added along the Refuge trails, and once The Fells completes the relocation of their parking lot, we would install a kiosk at the trailhead to provide interpretive information, maps and brochures, and to increase visibility of the Refuge.

Strategies

Continue to:

- Offer the Refuge to partners offering outdoor environmental education.
- Advertise events in local papers.

Within 2 years of CCP approval:

- Complete the new MOU with The Fells as soon as possible, but no later than within 2 years of CCP approval.

Within 3 years of CCP approval:

- Partner with others including The Fells, LSPA, Forest Society, and NH Audubon for educational programming and for materials distribution.
- Hire a seasonal (i.e., Memorial Day through Labor Day) Visitor Services Specialist co-located with The Fells at the gatehouse, who will:

    - Present interpretive programs about migratory birds and facets of management;
    - Conduct one teacher's workshop in the summer to facilitate environmental education use in the school year;
    - Lead interpretive walks on the Refuge;
    - Develop interpretive fact sheets for the Refuge, including a list of common Refuge wildlife and habitats.

Within 5 years of CCP approval:

- Design and install interpretive signs along the trail to replace the existing numbered interpretive stations.
- In coordination with partners, provide (additional) National Wildlife Refuge information at key sites.
- Provide educational materials and supplies to teachers in cooperation with our partners.

Within 10 years of CCP approval:

- Install a kiosk and provide associated interpretive panels and a fact sheet listing common wildlife species and habitats in The Fells new parking lot. Should construction for The Fells proposed parking area take longer than 10 years, we would endeavor to install the kiosk and associated materials within two years of completion of the parking area.

Accountability Measures

- Number and type of education and interpretive programs.
- Number of participants in environmental education and interpretation programs.
- Number of teacher's workshops conducted.

Goal 3. Communicate and collaborate with local communities, federal and state agencies, The Fells, and conservation organizations throughout the Lake Sunapee region to promote natural resource conservation, stewardship and the mission of the National Wildlife Refuge System.

Objective 3.1 Partner and Community Outreach

Continue to work closely with partners and increase community understanding and appreciation of the Refuge's importance to natural resource conservation and its contribution to the Refuge System, and garner additional support for Refuge programs, by meeting with partners at least once a year, and by conducting at least one community outreach program between Memorial Day and Labor Day.

Rationale

We rely heavily upon our partnerships given our limitations in staff and funding. It is of utmost importance for us to reach out and collaborate with our conservation partners in the region, including The Fells, Forest Society, NH FGD, LSPA and others, and to continue to facilitate communication regarding Refuge management, local conservation issues, and potential cooperative opportunities. We would continue to foster these partnerships. Historically, we have worked very closely with The Fells, and in this alternative, updating our MOU would be a priority, as we share common goals and resources. For example, one of the tenets of The Fells strategic vision and mission is to instill environmental awareness and stewardship in visitors (The Fells 2006). With this MOU, we have the opportunity to work cooperatively towards environmental conservation and public interaction with local natural resources.

It is particularly important that local residents understand, appreciate, and support the Refuge System mission and the Refuge's important contribution to that mission. It is through our partnerships that we

strive to develop an effective outreach program targeted at local communities and residents who may be unaware that a national wildlife refuge is nearby. We would continue to develop and strengthen these partnerships and to collaborate with them for outreach. Under this alternative, we would submit press releases and make announcements in The Fells newsletter if possible for Refuge accomplishments, special events and major initiatives in cooperation with our partners to keep the community interested and informed about Refuge activities.

Strategies

Continue to:

- Work closely with The Fells and Forest Society to coordinate with their outreach efforts.
- Keep local communities informed about Refuge events and attractions through direct contacts and local and statewide publications.
- Issue news releases on important accomplishments, to advertise special events, and to announce major management initiatives, in cooperation with partners.

Within 2 years of CCP approval:

- Complete the new MOU with The Fells as soon as possible, but no later than within 2 years of CCP approval.

Accountability Measures

- MOU with The Fells completed within 2 years.
- Annually meet with partners at The Fells.
- Number of newsletters and/or emails used to communicate with the public, including through The Fells.
- Number of news releases submitted.
- Number of local and statewide recreation and events publications/guides that include John Hay Refuge attractions and activities.

Objective 3.2 Outreach to Elected Officials

Over the next 15 years, inform elected officials about the Refuge purposes and management activities at least once a year, or as important issues arise.

Rationale

Gaining support from federal, state, and local elected officials is essential to meeting our goals. This can only happen when these elected officials are fully informed, and understand and appreciate the significant contribution of the Refuge to the Refuge System and the importance of federal trust resources in New Hampshire. The support of elected officials is integral for the continued funding and delivery of other resources necessary to achieve the goals and objectives of this plan. Our efforts to keep them informed would include meeting with the town select board once a year to provide annual Refuge updates, and continue to work with our partners to keep elected officials informed as issues arise. We would also make an effort to include elected officials in any outreach events held on the Refuge in collaboration with our partners.

Strategies

Continue to:

- Meet with town select board or a town-designated commission at least once a year to provide an update on Refuge activities.
- Meet with elected officials on as needed basis.
- Provide written or personal briefings for members of Congress, or their staff, as needed or as requested, to inform them about important Refuge issues.

Within 3 years of CCP approval:

- Invite federal, state, and local elected officials to attend and participate in outreach events held on the Refuge in cooperation with partners.

Accountability Measures

- Number of contacts with federal, state and town officials.
- Number of outreach events attended by federal, state and local officials.
- Annual meeting with town select board.

Objective 3.3 Intergovernmental Partnerships

Over the next 15 years, work to strengthen and enhance partnerships with federal, state, and local governmental agencies to fulfill mutual natural resource conservation goals.

Rationale

Present staffing and funding levels underscore the importance of creating and maintaining working partnerships with other governmental agencies to achieve Refuge goals, and to share expertise and resources. These agencies include NH FGD, NH Department of Environmental Services (NH DES), and NH Department of Resources and Economic Development (NH DRED). We would continue to foster these partnerships and facilitate communication regarding Refuge management, and conservation issues in the region, to enhance our ability to achieve these goals and objectives.

Strategies

Continue to:

- Coordinate with NH FGD and the Newbury Conservation Commission for resource management activities on or that may potentially affect the Refuge.
- Coordinate with NH FGD on fish and wildlife management facilitating close collaboration on biological, recreational, and law enforcement programs.
- Coordinate with the local governments in the Lake Sunapee Region.
- Coordinate water quality efforts and issues with NH DES (see Chapter 3) via the Lake Sunapee Protective Association.

Accountability Measures

- Number and types of collaborations pertaining to the Refuge with other government agencies.
- Number of contacts with governmental partners.

Alternative C. Active Habitat Management and Enhanced Visitor Services

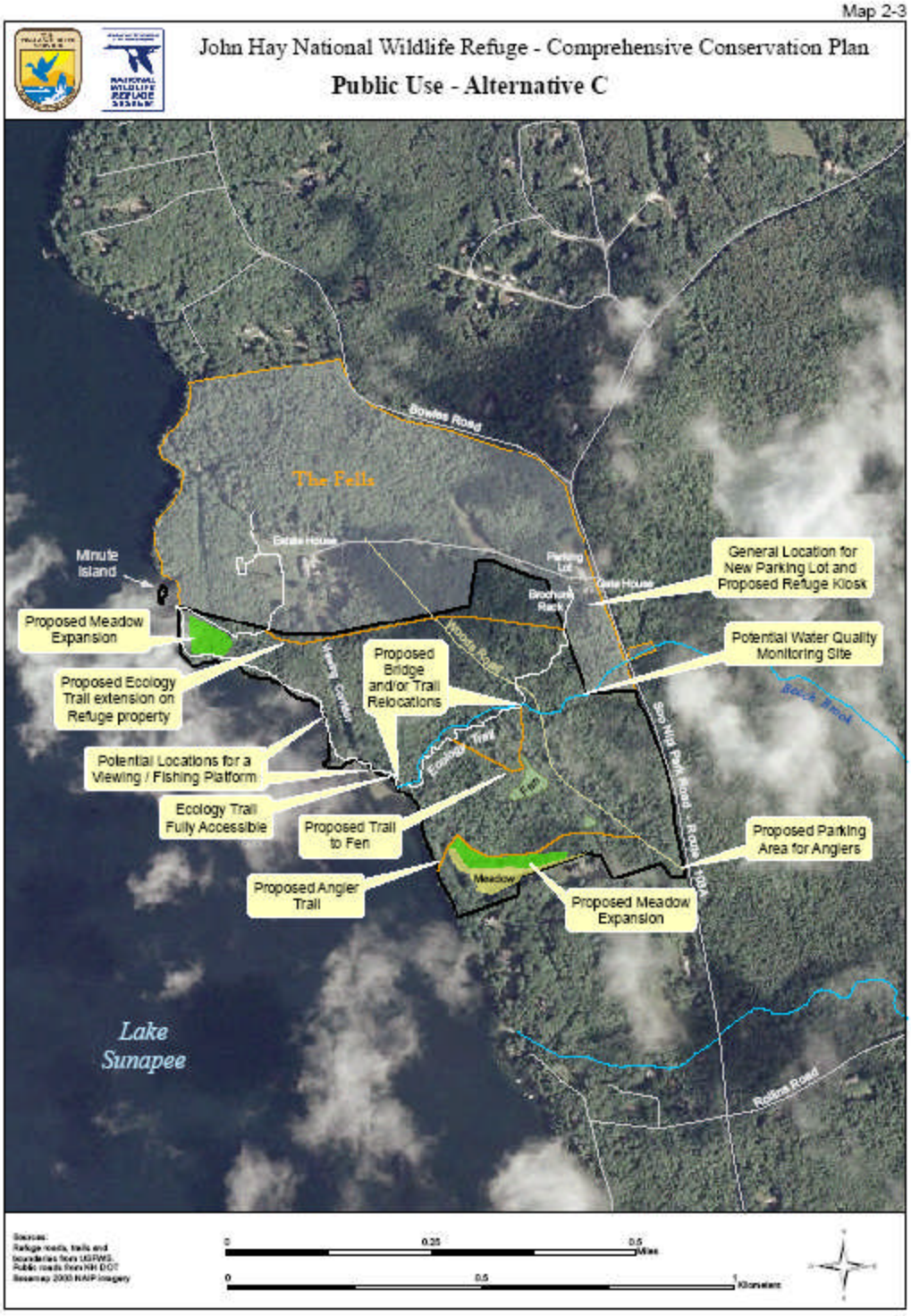
This alternative includes all of the activities mentioned under Alternative B, and goes farther to do more active habitat management and inventory programs, and its visitor services are greatly expanded.

Habitat Management

In Alternative C, we would incorporate the principles of adaptive management, and specifically Strategic Habitat Conservation where possible, as habitat management is the primary tool in attaining population objectives under this framework. Current levels of regeneration for white pine in particular, and northern forest tree species in general, would be evaluated to determine what efforts if any would be required to encourage regeneration on the Refuge. Such efforts could include soil scarification and stand thinning or selection cuts, and would be determined based on the outcome of the evaluation. Forest management would also include efforts to create and maintain a limited amount of early succession forest habitat. The location and size of this early succession habitat would be determined by reviewing the recent forest inventory and historical data and maps, though this could include widening The Fells viewshed. A Habitat Management Plan would be written to document habitat management activities necessary to meet the objectives of this alternative. Meadow habitat would be increased by expanding the current meadow up to approximately three acres as in Alternative B, depending on habitat and historical factors, and possibly adding a second meadow on the Refuge, the size and location of which would be determined based on available data. Again, mature trees would not be impacted by this management action. Principles of adaptive management would be used throughout, so that management activities would reflect the most recent information.

Beech Brook would receive at least one enhancement project to improve in-stream habitat, most likely where the Ecology Trail crosses and parallels the brook. We would evaluate the need for riparian restoration as well. We would work with our partners to establish a water quality monitoring station on the Refuge side (downstream) of Route 103A to directly assess the impacts of road run-off on the brook. We would evaluate options to either create new or enhance existing vernal pools on the Refuge. All other Refuge management activities would be the same as described in Alternative B.

Map 2-3


John Hay National Wildlife Refuge - Comprehensive Conservation Plan
Public Use - Alternative C
Bowles Road
The Fells
Estate House
Minute Island
Parking Lot
Brochure Rack
Gate House
General Location for New Parking Lot and Proposed Refuge Kiosk
Proposed Meadow Expansion
Potential Water Quality Monitoring Site
Proposed Ecology Trail extension on Refuge property
Proposed Bridge and/or Trail Relocations
Woods Road
Nursery Garden
Beaver Brook
Potential Locations for a Viewing / Fishing Platform
Ecology Trail Fully Accessible
Proposed Trail to Fen
Fen
Proposed Parking Area for Anglers
Proposed Angler Trail
Meadow
Proposed Meadow Expansion
Lake Sunapee
Route 103A
Rollins Road
0
0.25
0.5
Miles
0
0.5
1
Kilometers

Inventories and Monitoring

Actions under this heading are the same as Alternative B, with the addition of an updated inventory of breeding birds. We would likely use habitat monitoring as a surrogate for evaluating the effects of our management on priority wildlife species. It is not feasible, considering the Refuge size, staffing and funding available for the Refuge, to monitor migratory bird populations on this 80-acre Refuge in a statistically reliable way. At least one vernal pool breeding species survey would be conducted within five years of CCP approval, and at least one stream salamander breeding survey would be conducted as well.

Visitor Services

Visitor Services would be greatly expanded under this alternative due to the addition of a permanent full-time visitor services staff person stationed at the Refuge. Activities would be similar to those described under Alternative B, however, the breadth and focus would be expanded to include more programs, more community outreach, and to strengthen current and create new partnerships to facilitate education and interpretation of Refuge resources, year-round. The four priority public use programs currently allowed on the Refuge would be enhanced through activities described in Alternative B, and in Alternative C, we would establish a quality fishing program, and evaluate further the possibility of instituting a limited quota, archery-only white-tailed deer (*Odocoileus virginianus*) hunting season on the Refuge. The Ecology Trail would be upgraded to facilitate accessibility in conformance with the ADA requirements and would lead to a shoreline platform (Map 2-3). The other trail enhancements under Alternative B also would occur under Alternative C.

Refuge Administration

Under this alternative, the Refuge would hire one full-time permanent visitor services staff person to conduct and guide Refuge education and interpretation programs, and oversee all priority public use activities on the Refuge. The Service would work with The Fells to locate this position in the gatehouse, to minimize costs and enhance collaboration. As in Alternatives A and B, the MOU with The Fells would need to be updated and renewed to reflect our collaborative partnership and similar goals for natural resource stewardship. This includes the use of The Fells parking lot, which is currently located on the north side of the gatehouse. This agreement would still apply if The Fells completes their plan to move this parking lot to the south side of the gatehouse to accommodate a larger number of cars. Refuge Complex law enforcement personnel would be deployed to patrol the Refuge on an as-needed basis. Trail, sign, and kiosk maintenance would be ongoing.

In the section that follows, we describe in detail the goals, objectives, and strategies we would implement under Alternative C.

Goal 1. Contribute to the biological diversity and integrity of the Atlantic northern forest in the larger context of the Lake Sunapee region and Connecticut River watershed by protecting, enhancing, and restoring the Refuge's habitats, with an emphasis on breeding, migrating, and wintering birds.

Objective 1.1 Forest Habitat

Over the next 15 years, manage and enhance the forest character by actively promoting forest regeneration, where appropriate, on approximately 73 to 75 acres, depending upon current meadow expansion and the addition of a second meadow, of mature upland forest. Additionally, evaluate the possibility of providing additional early succession forest habitat. This would support a greater diversity of migratory and nesting birds of conservation concern, including but not limited to, the Canada warbler,

wood thrush, chestnut-sided warbler, and American woodcock. Any meadow expansion would not be at the expense of mature forest habitat.

Rationale

As described under Alternative B, the character of the Refuge forest is unique, and largely defined by the presence of rare legacy white pines. Unlike Alternative B, however, which would still allow natural processes to shape the Refuge forest with the exception of specific and limited forest management activities, we would actively manage forest stands for regeneration to perpetuate the existing mature forest composition, with an emphasis on white pine.

Classic forest succession in New England began with old-field white pine after the abandonment of farm fields in the mid nineteenth century (Foster and Aber 2004). Other species such as gray (*Betula populifolia*) and paper birch (*Betula papyrifera*), red maple (*Acer rubrum*), red cedar (*Juniperus virginiana*) and black cherry (*Prunus serotina*) were components of the reversion of fields to forests, but white pine was considered the most important. By the early twentieth century white pine was abundant enough in New England for the region to be named the "White Pine region" on forest maps. Extensive overharvesting occurred from the late 1800's until around 1920. Selective cutting of pine favored hardwood trees in the understory that were more shade tolerant. Today's forest landscape patterns often include primary woodlands supporting hardwood-hemlock forests, sites abandoned in the nineteenth century which support hardwoods that succeeded harvested pines, and white pine on more recently abandoned sites.

The John Hay Refuge forest reflects this history. White pines that once dominated the forest are being replaced by shade tolerant hardwoods including sugar maple (*Acer saccarum*), yellow birch (*Betula alleghaniensis*) and red oak (*Quercus rubra*), and will eventually succeed to hemlock and beech (*Fagus grandifolia*). The legacy white pines are remnants of this era of second growth after farm fields were left fallow in the mid- to late-1800s. They represent the era when John Hay took ownership of these abandoned or sold-off fields and began the family's legacy of conservation. To perpetuate this land use legacy, and to maintain the unique character of the Refuge forest, we would emphasize white pine regeneration on selected sites on the Refuge. This would potentially include small patch cuts, prescriptive thinning, soil scarification and/or other silvicultural practices to open the forest canopy, allowing light to reach the forest floor, and to loosen topsoil to promote white pine seed establishment.

The possible addition of an early forest succession patch would potentially be incorporated on the Refuge as an extension of The Fells viewshed, by widening it from its current one-acre size. The exact location would be dependent on many factors, but its addition would have many benefits that we would take into consideration. First, it would promote pine regeneration by allowing sunlight to reach the forest floor and would give fast-growing young white pine an advantage. Second, it would benefit American woodcock by providing more structural density in the understory, a requirement for nesting and brood-rearing (Kelley et al. (eds) 2008). And, finally, it would benefit a host of species that prefer forest edge habitat including many small mammals, and bird species like the chestnut-sided warbler and ruffed grouse (*Bonasa umbellus*).

In the original deed (Deed of Donation from Alice Hay to the United States of America, December 11, 1972), Alice Hay stipulated that this property be used "exclusively for public use as an inviolate sanctuary for migratory birds, as a migratory bird and wildlife reservation to be known as the John Hay National Wildlife Refuge, and for other conservation purposes consistent therewith." We realize that this type of active management differs from historic Refuge management, but believe that these conservation actions would be viable alternatives, in keeping with the family's wishes for bird and wildlife conservation.

In addition, this enhanced management would continue to uphold the Refuge's establishing purpose as a migratory bird reservation. Canada warbler and wood thrush, two species of high priority conservation concern, would still benefit under this management scenario because the majority of the Refuge would be mature forest habitat, and these early successional treatments would provide more structural complexity. Studies have shown that the Canada warbler requires some amount of structural complexity in the forest understory (Lambert and Faccio 2005) which would increase in an early succession forest patch, and the wood thrush would benefit from this as well (Dettmers [updated 2006]). Conducting a forest inventory on a recurring 10- to 15-year basis would help us monitor for suitable habitat conditions and vegetation change over time. This recurring forest inventory would also serve the dual purpose of creating baseline data and subsequent monitoring for potential changes due to climate change (e.g., cumulative factors including forest species composition, forest health, and exotic invasive species).

Strategies

Continue to:

- Eliminate trees that present safety hazards as needed where brought to the attention of the Service. These would be trees that have fallen or are leaning over the trail or other key visitor use areas to maintain safety and access. Hazard trees would be dropped and left in place to serve as coarse woody debris used as foraging sites and cover by wildlife, and to replenish soil nutrients. On other areas of the Refuge, dead or dying trees would be left as part of the natural landscape.
- Respond to natural events that change forest structure, such as ice storm and wind damage to address safety and viewshed concerns (e.g., if a big windstorm left broken and toppled trees throughout sections of the Refuge forest, we would consider initiating salvage operations to clean up some of the debris, depending on the extent and severity of damage).
- Treat for disease and insect outbreaks as needed by working with state and local partners to prevent excessive losses on the Refuge or from affecting adjacent lands.

Within 1 year of CCP approval:

- Complete and implement an HMP within one year of CCP approval.

Within 5 years of CCP approval:

- Work with The Fells to develop a treatment schedule for the viewing easement within the new Memorandum of Understanding that incorporates both scenic and wildlife habitat objectives.
- Determine the extent and vitality of existing forest regeneration within stands.
- Develop rapid response protocols with partners to quickly detect and address invasive plant species, disease and insect outbreaks, blow down events, due to wind, ice and other natural events.

Within 10 years of CCP approval:

- Expand the width of The Fells viewshed to provide additional habitat for wildlife dependent upon early successional habitat, and provide an increased view of the lake from estate house.

Within 15 years of CCP approval:

- Initiate forest inventory monitoring on a 10- to 15-year recurring basis to detect and evaluate changes due to natural succession and those predicted for habitat management projects. This would serve the dual purpose of establishing baseline information as well as a systematic method to detect potential impacts associated with climate change over time.
- Collaborate with partners including NH Audubon and NH FGD to conduct bird species inventories every 10 to 15 years to monitor species presence over time.
- Ensure that Refuge habitat complements the larger landscape composition and structure for priority species.
- Develop silvicultural prescriptions, such as precommercial thinning or soil scarification, to promote regeneration success.
- Determine an appropriate amount of early successional habitat for the Refuge and maintain it through regular, periodic treatments.
- Conduct and update forest inventory and mapping on an as needed basis, but at least once during the 15-year CCP cycle.

Accountability Measures

- Forest acreage by stand composition and structure, based on the forest inventory from 2008.
- Number of acres of successful forest regeneration.
- Number of forest acres under active management.
- Number of acres impacted by natural processes and the resultant compositional and structural changes.

Objective 1.2 Meadow Habitat

Within ten years, if suitable sites are located, expand the current meadow up to a total of 3.0 (+/-) acres, dependent upon habitat and historical factors, and explore the potential of creating a second one- to three-acre meadow elsewhere on the Refuge. Suitable sites would have site conditions suitable for meadow establishment and be generally devoid of large trees. These enhancements would further support species of conservation concern identified in the BCR 14 and NH WAP plans on the Refuge, including American woodcock and other migratory and breeding species, dependent upon meadow for habitat. Any meadow expansion would not be at the expense of mature forest habitat.

Refuge meadow: Barry Parrish/USFWS

Rationale

Because high quality, undeveloped meadow habitat is limited in the region and deemed a priority for the reasons stated in Alternative B, this alternative prioritizes creating additional habitat for American woodcock and other species requiring open meadows, in keeping with the Refuge's establishing purpose. Not only would this include expanding the current meadow as described in Alternative B, but we would also explore the potential of creating a new meadow on the Refuge. First, a careful review would be conducted of historical records, maps, and stone walls as well as the habitat inventory to help determine an appropriate size and place to expand meadow acreage. Then the Service would create these meadows/forest openings through mechanical treatments, and continue to treat these openings as needed to maintain the desired herbaceous habitat conditions. Healthy, mature trees would not be harvested solely to create meadow habitat. We would work with The Fells to develop a treatment schedule for the viewing easement that incorporates both scenic and wildlife habitat objectives.

Strategies

Continue to:

- Use mechanical treatments (e.g., mowing) once every two years after September 15th or as conditions warrant to retain a primarily herbaceous composition.

Within 5 years of CCP approval:

- Develop partnerships to mow the meadows.
- Review historical records, maps, and stone walls, as well as the habitat inventory, to help determine whether there is an appropriate size and place to expand meadow acreage on the Refuge.

Within 15 years of CCP approval:

- Expand the current meadow and create a second one- to three-acre meadow on the Refuge.
- Collaborate with partners including NH Audubon and NH FGD to conduct bird species inventories every 10 to 15 years to monitor species presence over time.

Accountability Measures

- Number of meadow acres.
- Frequency of treatments.
- Presence or absence of avian species of conservation concern.

Objective 1.3 Wetlands Habitat

Over the next 15 years, protect and monitor Refuge wetlands for the benefit of amphibians and reptiles by completing at least one vernal pool species breeding survey within the next 5 years. In addition, continue to allow natural processes to influence fens, vernal pools and other wetland habitats on the Refuge that may provide important breeding and foraging habitat for amphibians and reptiles of conservation concern identified in the NH Wildlife Action Plan, NE PARC, and other regional plans, such as spotted salamander.

Rationale

In this alternative, the Service prioritizes the importance of vernal pools and fens, for the reasons stated in Alternative B, and would conduct and complete additional inventory, research, and monitoring of these important wetlands. Further, the Service would evaluate the condition of existing vernal pools and determine the need to enhance them, or to create additional vernal pools on the Refuge to ensure the availability of quality habitat for many of the amphibian and reptile species that rely on them as a vital part of their life-cycles. We would commit to working with the NH FGD to monitor, restore, enhance and/or create wetlands, and to comply with their survey requirements and data submission to the NH FGD Reptile and Amphibian Reporting Program.

Strategies

Continue to:

- Monitor to ensure that management activities or trail re-location do not adversely impact the fens.

Within 3 years of CCP approval:

- Inventory and georeference vernal pools and fens on the Refuge, before any trail enhancement or habitat management is implemented.

Within 5 years of CCP approval:

- Record the presence/absence of vernal pool-obligate species according to acceptable survey protocols.
- Coordinate with NH FGD for survey protocols and data submission to the NH FGD vernal pool database, and Reptile and Amphibian Reporting Program.

Within 15 years of CCP approval:

- Create new and/or enhance existing vernal pools.

Accountability Measures

- Number of vernal pool surveys.
- Presence/absence/abundance of species of conservation concern.
- Number of vernal pools and fens on Refuge.
- Total acreage of wetland habitats on the Refuge.

Objective 1.4 Riparian and In-stream Habitat

Within the next 15 years, enhance the in-stream habitat and riparian corridor along the approximately 1,750 feet of Beech Brook by completing at least one stream enhancement project for species identified as conservation priorities, including brook trout, according to Eastern Brook Trout Joint Venture and NH WAP guidelines.

Rationale

We described the importance of Beech Brook for brook trout, and to the biological health of the lake, in Alternative B. Under this alternative, due to the presence of a permanent staff member on-site, we anticipate visitor use will increase with the expansion of the visitor services program and the possible addition of two wildlife-dependent public uses, hunting and fishing. This will undoubtedly put additional pressure on already sensitive riparian habitats, and we would increase our vigilance and efforts concomitantly to minimize negative biological impacts on Beech Brook. To this end, we would more actively partner with LSPA to monitor and maintain the high level of water quality, and to install a water quality monitoring station west of Route 103A on the Refuge that would better help us monitor the impacts of road run-off downstream. We would work with NH FGD to conduct additional inventory, monitoring, and research on in-stream and riparian habitat and associated species, and to evaluate opportunities for stream rehabilitation and/or riparian habitat restoration, particularly in the area of the Ecology Trail. These continued stream surveys and water quality monitoring efforts would also serve the dual purpose of creating baseline data and subsequent monitoring for potential changes due to climate change or other anthropogenic-induced impacts (e.g., cumulative factors including species composition, water temperature, presence and levels of biological and chemical parameters, as well as exotic invasive species).

Strategies

Continue to:

- Rely on LSPA to monitor Beech Brook and collect water quality data.

Within 1 year of CCP approval:

- Post the area around the mouth of Beech Brook as closed to the beaching of boats.

Within 5 years of CCP approval:

- Relocate the Refuge's nature trail away from sensitive riparian areas and/or replace existing crossings with a footbridge(s), if it is found to negatively affect stream health.
- Assess the impacts of rafting, and other public use on the biological health and integrity at the mouth of Beech Brook and manage to mitigate those impacts.
- Work with partners to establish a water quality monitoring site on the Refuge to evaluate the influence of road treatments on Beech Brook.
- Work with partners to assess the impacts of winter road treatments on the biological health and integrity of Beech Brook and mitigate any negative impacts.
- Conduct an amphibian survey of Beech Brook.

Within 10 years of CCP approval:

- Partner with NH FGD to:
    - Conduct stream surveys and species inventories;
    - Assess brook trout population structure;
    - Identify key habitats for brook trout and rainbow smelt.
- Identify opportunities for stream rehabilitation and/or riparian restoration, particularly in areas where the current trail intersects or closely parallels Beech Brook.

Within 15 years of CCP approval:

- Partner with NH FGD to:
    - Design and implement any stream enhancement projects.

Accountability Measures

- Number of stream enhancement projects.
- Brook trout population structure.
- Measurements of water quality.
- Quality of brook trout habitat.
- Number of stream surveys and species inventories for fish and amphibians.

Objective 1.5 Shoreline/Minute Island

Continue to protect the approximately 3,100 feet of undeveloped Refuge shoreline and 0.1 acres of Minute Island by preventing public use and activities that may pose risks to the integrity of these habitats.

Rationale

As in Objective 1.4 under Alternative C, we anticipate an increase in visitor use as a result of additional staff and the subsequent expansion of our visitor services program. This increase in resource use will require careful monitoring of sensitive habitats, including the shoreline and Minute Island, to ensure that public uses have minimal negative impacts. Therefore, conducting a baseline inventory of shoreline habitat and assessing habitat condition will be a priority under this alternative to provide a method of comparison over time. To prevent unauthorized use, we would post signs along the shoreline detailing Refuge shoreline policy as in Alternative B, and we would also continue to work with our partners, and the NH Marine Patrol to monitor and enforce shoreline use. Under this alternative, we would deploy Refuge Complex law enforcement officers to patrol the Refuge on high-use days and the presence of a permanent staff member on site would provide additional monitoring capabilities year-round for shoreline use and policy compliance. The visitor services specialist would also include outreach efforts targeted towards boaters and lake visitors to increase awareness of Refuge shoreline policy as a part of his or her job duties.

Strategies

Continue to:

- Deploy law enforcement officers to patrol the Refuge on select high-use days.
- Work with NH FGD and NH Marine Patrol to monitor and enforce posted Refuge signs.

Within 1 year of CCP approval:

- Install signs closing the Refuge shoreline to all rafting, beaching of boats, and public access from the lake to minimize adverse impacts to the undeveloped shoreline and nearshore habitats.

Within 3 years of CCP approval:

- Hire a full time Visitor Services Specialist at the Refuge year-round to help monitor shoreline policy compliance and shoreline condition.
- Increase awareness of Refuge boat landing policies by conducting outreach with town and other local marina's by posting flyers at those venues.
- Assess baseline shore condition and evaluate the need for restoration.

Within 5 years of CCP approval:

- Evaluate the impacts, if any, of rafting/beaching water craft on the Refuge.

Accountability Measures

- Number of days law enforcement officers were deployed to the Refuge.
- Number of incidents reported.
- Number of signs posted or maintained on the Refuge to prohibit boat landing.
- Feet of disturbed shoreline and the underlying cause.
- Number and type of locations used to post flyers advertising Refuge beach policies.

Goal 2. Promote natural resource conservation, stewardship, the mission of the National Wildlife Refuge System and enjoyment of the John Hay Refuge by providing high-quality, compatible, wildlife-dependent public use opportunities on Refuge lands and neighboring conserved lands and waters.

Objective 2.1 Hunting

Within three years of CCP approval, evaluate the compatibility of a limited-quota archery white-tailed deer hunting program on the Refuge, in partnership with NH FGD and The Fells. Utilize U.S. Fish and Wildlife Service guiding policies as well as partner and public input.

Rationale

The Improvement Act identifies hunting as priority wildlife-dependent recreation and it is an established traditional use in the local area. Executive Order #13443, issued by President Bush in August 2007, directs the Service and other land management agencies "...to manage wildlife and wildlife habitats on public lands in a manner that expands and enhances hunting opportunities, including through the use of hunting in wildlife management planning."

We recognize hunting as a healthy, traditional outdoor pastime, deeply rooted in our American heritage. In fact, in New Hampshire, the 2007 white-tailed deer hunting season was the second-best ever in recorded history, with a total of 13,559 animals harvested (compared to 1967's total of 14,204 deer harvested). In Newbury, 35 deer were harvested (26 male, 9 female) in 2007, or 0.98 kills per square mile (NH FGD 2008). In deer management unit I2, encompassing the town of Newbury, the NH FGD are currently engaging in a program to increase deer densities, as it is estimated to be lower than in adjacent management units and is capable of supporting higher numbers. They will do this through a combination of setting appropriate harvest limits, managing for desirable age and sex ratios, and conserving important deer habitat (NH FGD 2005).

The Refuge would be able to partner with NH FGD to promote hunting both as a population management tool, and to encourage habitat stewardship and a connection with natural resources. Because the Refuge only comprises 80 acres, the effect on harvest numbers for the entire deer management unit I2 would be negligible. When managed responsibly, this activity can instill a unique understanding and appreciation of wildlife, their behavior, and their habitat needs, as well as their role in the surrounding environment. Additionally, hunting is the primary management tool NH FGD uses to meet deer population objectives.

As discussed in Alternative A, Objective 2.1, the small size of the Refuge and the trail system could potentially engender user conflicts with the incorporation of a general hunt program. Therefore, under this Alternative, we would begin to evaluate the possibility of incorporating a very restricted, limited-quota, quality deer hunting program on the Refuge that would be archery only. Steps would be taken to fully evaluate such a hunt through the NEPA process and assess compatibility. We would work with our partners and the public to evaluate opportunities for hunting on the Refuge, and take into consideration their comments and concerns. Public meetings would be held to solicit public input regarding hunting at the Refuge.

Strategies

Within 2 year of CCP approval:

- Complete a compatibility determination for hunting.

Within 3 years of CCP approval:

- Coordinate with NH FGD, The Fells, and the public to evaluate potential opportunities for a limited quota archery season for white-tailed deer.
- Complete the necessary planning and a Hunt Management Plan within 3 years of CCP completion if hunting is determined to be a compatible public use at the Refuge.

Accountability Measures

- Completion of a compatibility determination.
- Completion of required planning documents, if hunting is found to be compatible.
- Number of hunter use days.
- Annual harvest on the Refuge.

Objective 2.2 Recreational Fishing

Within two years of CCP approval, open the Refuge to sport fishing, and within five years of CCP approval, enhance the existing Ecology Trail to conform to ADA guidelines.

Rationale

For reasons described in Alternative B, we would initiate a quality Refuge fishing program as one of the six priority wildlife-dependent public uses. The angler parking area and trail to the lake would be included in this alternative as described in Alternative B. Under Alternative C, we would provide a wider trail that would better withstand a higher volume of visitors, and that would meet the requirements of the ADA. This improved trail would lead to a platform at the shoreline to provide lakeshore access and fishing opportunities to a wider audience, including persons with disabilities. Widening and adding a boardwalk and viewing platform to the existing Ecology Trail would expand fishing opportunities for all

visitors, but especially those with mobility limitations. This platform would concentrate public use, by anglers and other recreationists, to one pre-planned location and would therefore prevent impacts along the length of the Refuge shoreline. Any platform built would be aesthetically pleasing and placed in such a way as to minimize its presence in the shoreline habitat. Due to the anticipated increase in visitor usage under Alternative C with an expanded visitor services program, we would increase our vigilance to ensure compliance in shoreline use and fishing regulations. On select high use days, Conte Complex law enforcement personnel would be deployed to the Refuge to monitor and enforce Refuge policies.

Strategies

Continue to:

- Monitor public use impacts to habitats associated with the angler trail once established.

Within 2 years of CCP approval:

- Coordinate with NH FGD, The Fells, local government officials, local conservation organizations, and the public to establish a quality fishing program.

Within 5 years of CCP approval:

- Complete trail improvements that would increase public safety by including a packed surface, a wider walkway, and better markings that would lead to a platform at the lake shore. Through these improvements, it would have the added benefit of providing ADA-compliant access to Beech Brook and the Lake Sunapee shoreline.

Accountability Measures

- Number of angler-use days.

Objective 2.3 Wildlife Observation and Photography

Enhance quality wildlife observation and photography opportunities throughout the approximately 80 acres of the Refuge by instituting trail improvements that would increase safety, and focus traffic to a better defined trail. This would have the added benefit of being ADA-compliant, including a wildlife viewing platform, with aesthetic and environmental considerations in mind, on the lakeshore over the next 15 years.

Rationale

As described in Alternative B, the Service would seek to enhance wildlife and habitat viewing and photographing opportunities on the Refuge. In relocating a portion of the Ecology Trail, we would seek a route that enhances the potential for wildlife observation and photography, while reducing impacts to Beech Brook and increasing visitor safety. We would install additional interpretive signs along this trail. Again, with the increase in use of the Refuge property as anticipated with an expanded visitor services program, we would need to incorporate additional options to mitigate for the effect of this higher volume on Refuge resources. This would include providing a wider, ADA-compliant Ecology Trail that would lead to a lakeshore viewing platform, and would serve the dual purpose of accommodating a higher volume of people, and to provide access to the Refuge and lakeshore to persons with disabilities for

wildlife observation and photography. The addition of this platform would increase access to the lake, a prominent natural feature of the Refuge, for the five priority uses allowed in such a way that would minimize direct impacts to the shoreline. This new trail and platform would have the dual benefit of concentrating use in a planned location, and effectively limit foot traffic throughout the rest of the Refuge. The stretch of undeveloped shoreline is one of the Refuge's pre-eminent natural features and any structure would be constructed to be aesthetically pleasing and placed to minimize its presence in the lakeshore habitat. It would allow for the continued access and appreciation of the resource, while minimizing adverse impacts to the shoreline.

Wildlife Observation: Steve Hillebrand

Strategies

Continue to:

- Maintain boundary signs.

Within 3 years of CCP approval:

- In coordination with partners, provide (additional) National Wildlife Refuge information at key sites.
- Provide a fact sheet list of common wildlife species and habitats likely found on the Refuge at the kiosk, and in a Refuge brochure within 3 years of CCP completion.

Within 5 years of CCP approval:

- Relocate the trail away from sensitive habitats, including in stream habitat and to take advantage of wildlife/habitats observation opportunities.
- Install footbridges or some other improvement at stream crossings to promote public safety and environmental stewardship.
- Install interpretive signs along the trail that describe the wildlife, fish, plants and habitats, the Service, National Wildlife Refuge System, the Connecticut River Watershed, and the Refuge.

- Coordinate with The Fells, Forest Society, and NH Audubon to increase awareness of, and opportunities to experience, the diversity of habitats and associated wildlife observation experiences on the Refuge and adjacent conservation lands.

Within 10 years of CCP approval:

- Conduct trail improvements that would include the installation of a hard surface, increasing the width to about five feet, better distinguishing it from its environs, and leading to a wildlife viewing platform at the lake shore, if feasible. This would have the added benefit of being ADA compatible.
- Create a trail extension from the Ecology Trail to one of the fens and back, with the addition of interpretive panels to provide information about the ecological role of fens.
- Install a kiosk and provide associated interpretive panels and a fact sheet listing common wildlife species and habitats in The Fells new parking lot. Should construction for The Fells proposed parking area take longer than 10 years, we would endeavor to install the kiosk and associated materials within two years of completion of the parking area.

Accountability Measures

- Number of participants using Refuge.
- Number of interpretive signs installed.
- Length of the Ecology Trail that is relocated.
- Length of boundary line maintained.

Objective 2.4 Environmental Education and Interpretation

Over the next 15 years, conduct interpretive and environmental education programs and create informational materials that reach 50 percent of the total visitors to The Fells throughout the year, and conduct at least five offsite programs per year.

Rationale

With the addition of a permanent visitor services staff member on-site, our capabilities to provide quality environmental education and interpretation programs on the Refuge would be greatly expanded. As described under Alternative B, we would work closely with teachers at local schools to provide curriculum-based materials and field trip opportunities, and provide more interpretive programs on-site. Under Alternative C, we would commit to conducting more off-site programs each year, which could include giving presentations at local schools, state parks, campgrounds, civic groups, and to conservation organizations. In addition, we would be able to provide a greater number of programs year-round, a greater diversity of programs, and to work with more schools in more of the communities that surround Lake Sunapee. Our commitment to working with our partners to provide quality programming on the Refuge would remain unchanged, and is described under Alternative B.

Strategies

Continue to:

- Offer the Refuge to partners offering outdoor environmental education.

Within 2 years of CCP approval:

- Complete the new MOU with The Fells as soon as possible, but no later than within 2 years of CCP approval.

Within 3 years of CCP approval:

- Hire a full-time permanent Visitor Services Specialist co-located with The Fells at the gatehouse, who will:

    - Provide environmental educational materials and supplies to teachers within 1 year of being hired.
    - Schedule environmental education-oriented field trips within 1 year of being hired.
    - Conduct interpretive programs at Mount Sunapee State Park and local schools within 1 year of being hired.
    - Establish and maintain relationships with local town governments within 1 year of being hired.
    - Provide brochures and fact sheets at the Gatehouse within 1 year of being hired.
    - Participate in local events where the Refuge can be interpreted within 1 year of being hired.
    - Give presentations to civic groups and local conservation organizations within 1 year of being hired.
    - Develop programs for local school systems to highlight the Refuge and National Wildlife Refuge System, within 2 years of being hired.
    - Conduct interpretive programs in area campgrounds within 2 years of being hired.
    - Update and expand partnerships with local organizations to provide additional interpretation and environmental education opportunities within 3 years of being hired.
    - Develop a Refuge website to provide information on Refuge resources, issues, wildlife, and habitat management highlighting its role in migratory bird conservation within 3 years of being hired.
    - Conduct summer workshops for teachers to facilitate environmental education use during the school year within 3 years of being hired.

Within 5 years of CCP approval:

- Design and install interpretive signs along the trail to replace the existing numbered interpretive stations.
- Provide educational materials and supplies to teachers.

Within 10 years of CCP approval:

- Install a kiosk and provide associated interpretive panels and a fact sheet listing common wildlife species and habitats in The Fells new parking lot. Should construction for The Fells proposed parking area take longer than 10 years, we would endeavor to install the kiosk and associated materials within two years of completion of the parking area.

Accountability Measures

- Number and type of environmental education and interpretation programs.
- Number of participants in environmental education and interpretation programs.
- Number of teacher's workshops conducted.

Goal 3. Communicate and collaborate with local communities, federal and state agencies, The Fells, and conservation organizations throughout the Lake Sunapee region to promote natural resource conservation, stewardship and the mission of the National Wildlife Refuge System.

Objective 3.1 Partner and Community Outreach

Continue to work closely with partners and increase community understanding and appreciation of the Refuge's importance to natural resource conservation, its contribution to the Refuge system, and to garner additional support for Refuge programs, by conducting at least five outreach programs per year.

Rationale

Alternative C is designed to be much more proactive in our outreach efforts, and our priority would be to participate in more community-based outreach programs each year. We would endeavor to honor requests for speaking engagements with local civic groups, schools, conservation organizations and other community groups, and participate in local events. Further, we would provide opportunities for community members to participate in workshops, and citizen science projects based on Refuge-relevant topics. It is important, if we are to be a valued part of the communities we serve, that we communicate often with our local citizens. News articles, updating the website, and personal appearances inform our neighbors about what we are doing and why, which we hope will lead to increased understanding, appreciation, and support of our programs. Feedback we receive from these outreach efforts allows us to understand better the issues that are important in our communities, and how our management may affect them.

The relationships we create with our partners are extremely important to the success of the programs, outreach, and role of the Refuge in the community. We must nurture those partnerships as we seek to expand our role in conservation, education, and recreation in the local communities around the Refuge. Under Alternative C, we would continue to meet with The Fells on an on-going basis, and to coordinate with their outreach efforts. In addition, we would update the MOU with The Fells within two years of CCP approval. One of the tenets of The Fells strategic vision and mission is to instill environmental awareness and stewardship to visitors (The Fells 2006). With this MOU, we have the opportunity to work cooperatively towards environmental conservation and public interaction with local natural resources. We would also conduct an annual meeting at The Fells to provide Refuge updates to all of our conservation partners and to facilitate communication and collaboration on conservation priorities.

Strategies

Continue to:

- Work closely with The Fells and Forest Society to coordinate with their outreach efforts.
- Keep local communities informed about Refuge events and attractions through direct contacts and local and statewide publications.

- Issue news releases on important accomplishments, to advertise special events, and to announce major management initiatives, in cooperation with partners.
- Conduct an annual coordination meeting at The Fells for partners to update each other on accomplishments and upcoming activities.
- Meet with The Fells on an ongoing basis.

Within 2 years of CCP approval:

- Complete the new MOU with The Fells as soon as possible, but no later than within 2 years of CCP approval.

Within 3 years of CCP approval:

- Honor requests for speaking engagements by local community and civic organizations to inform members about Refuge purposes and activities, as staff numbers and resources allow.
- Create a new Refuge website.
- Provide workshops and encourage citizen science projects in cooperation with partners, as staff numbers and resources allow.

Accountability Measures

- MOU with The Fells completed within 2 years.
- Number of news releases submitted.
- Number of speaking engagements.
- Annually meet with partners at The Fells.
- Number of local events in which the Service participates.

Objective 3.2 Outreach to Elected Officials

Over the next 15 years, inform elected officials, including federal officials, about the Refuge purposes and management activities at least once a year, or as important issues arise.

Rationale

It is important that elected officials at all levels of government, as representatives of all American citizens, be informed about the nationally important contributions of refuge lands toward wildlife conservation and wildlife-dependent recreation. This is true of both potentially controversial issues and the routine achievements toward accomplishing our objectives. Under Alternative C, we would ensure that we keep elected officials informed by inviting them to participate in local outreach events on the Refuge, and/or to participate in a guided tour of the Refuge that highlights its natural resources, management activities, challenges, and accomplishments. We would provide these opportunities at least once a year, or more frequently as issues arise.

Strategies

Continue to:

- Meet with town select board or a town-designated commission at least once a year to provide an update on Refuge activities.
- Meet with elected officials on an as-needed basis.
- Provide written or personal briefings for members of Congress, or their staff, as needed or as requested, to inform them about important Refuge issues.

Within 3 years of CCP approval:

- Invite federal, state, and local elected officials to attend and participate in outreach events held on the Refuge in cooperation with partners.

Within 5 years of CCP approval:

- Invite federal elected officials to attend guided tours of the Refuge to display particular accomplishments, gain a better understanding of the Refuge, demonstrate management activities, and highlight challenges.

Accountability Measures

- Number of events and guided tours attended by federal, state and local officials.
- Number of contacts with federal, state, and town officials.
- Annual meeting with town select board.

Objective 3.3 Intergovernmental Partnerships

Over the next 15 years, work to strengthen and enhance partnerships with federal, state, and local governmental agencies to fulfill mutual natural resource conservation goals.

Rationale

As in Alternative B, we would continue to foster intergovernmental partnerships and facilitate communication regarding Refuge management, and conservation issues in the region, to enhance our ability to achieve these goals and objectives. Locally, these intergovernmental agencies include NH FGD, NH DES, NH DRED, local governments, and others. We could achieve an even greater return for the environment if we worked together on a strategic basis. That would involve establishing a forum to share long-term plans such as our CCP, the NH WAP, master plans, and other strategic documents to examine overlapping goals and determine methods to work together toward meeting shared objectives.

Strategies

Continue to:

- Coordinate with NH FGD and the Newbury Conservation Commission for resource management activities on or that may potentially affect the Refuge.

- Coordinate with NH FGD on fish and wildlife management facilitating close collaboration on biological, recreational, and law enforcement programs.
- Coordinate with the local governments in the Lake Sunapee Region.
- Coordinate water quality efforts and issues with NH DES via the Lake Sunapee Protective Association.

Within 5 years of CCP approval:

- Actively participate in town/region conservation planning efforts, particularly in terms of the Refuge's role in habitat conservation with respect to the larger landscape.

Accountability Measures

- Number and types of collaborations pertaining to the Refuge with other government agencies.
- Number of contacts with intergovernmental partners.

Supracanopy white pine: Erin Victory

Table 2.1. Comparison of the Considered Alternatives.

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
Goal 1. Contribute to the biological diversity and integrity of the Atlantic northern forest in the larger context of the Lake Sunapee region and Connecticut River watershed by protecting, enhancing, and restoring the Refuge's habitats, with an emphasis on breeding, migrating, and wintering birds.			
Responds to Issues: How can we manage habitat for migratory birds that most effectively fulfills the establishing purpose of the Refuge? In what ways can we minimize impacts of any management activities to protect the 3,100 feet of undeveloped Refuge shoreline? How can we protect, restore, or enhance the riparian corridor along Beech Brook, and in-stream water quality to maintain its utility as a reference stream for the Lake Sunapee watershed? How can we strive to balance both the cultural heritage (i.e., large white pines) of the forest character and the legacy of minimal management by the Hay family? How does the Refuge fit into the greater landscape context of the region, and how can we complement that larger context with our management activities on the Refuge or coordinate management with our local conservation partners? What steps can be taken prior to any ground-disturbing management activities to protect potential sites of archaeological importance?			
Forest Habitat	Over the next 15 years, continue to allow the 77.6 acres of mature upland forest to be shaped by natural processes (e.g., mortality, blow downs) that may encourage natural regeneration, maintain the cultural legacy, and diversify the forest structure that supports migratory and nesting birds of conservation concern in BCR 14 and NH WAP. This includes, but is not limited to, the Canada warbler and wood thrush. Eliminate trees that present safety hazards (drop and leave in place) as	Over the next 15 years, allow natural processes (e.g., mortality, blow downs) to continue to shape the approximately 76 acres, assuming expansion of the existing meadow, of upland forest that may encourage natural pine regeneration and diversification of forest structure. This would benefit migratory and nesting birds of conservation concern in BCR 14 and NH WAP including, but not limited to, the Canada warbler and wood thrush. Any meadow expansion would not be at the expense of mature forest habitat. *In addition to Alternative A strategies:*	Over the next 15 years, manage and enhance the forest character by actively promoting forest regeneration, where appropriate, on approximately 73 to 75 acres, depending upon current meadow expansion and the addition of a second meadow, of mature upland forest. Additionally, evaluate the possibility of providing additional early succession forest habitat. This would support a greater diversity of migratory and nesting birds of conservation concern, including but not limited to, the Canada warbler, wood thrush, chestnut-sided warbler, and American woodcock. Any

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
	needed, where brought to the attention of the Service. Treat for disease and insect outbreaks as needed with partners.	Respond to natural events that change forest structure to address safety and viewshed concerns including timber salvage operations. Complete and implement an HMP within one year of CCP approval. Work with The Fells to develop a treatment schedule for the viewing easement in the new MOU that incorporates both scenic and wildlife habitat objectives. Develop rapid response protocols with partners for invasive plant species, disease and insect outbreaks, and blow down events due to wind, ice and other natural occurrences. Conduct forest inventories on a 10- to 15-year recurring basis to determine next steps, and provide a systematic method of vegetation monitoring over time. Collaborate with partners including NH FGD and NH Audubon to conduct bird species inventories every 10 to 15	meadow expansion would not be at the expense of mature forest habitat. *In addition to Alternative B strategies:* Determine the extent and vitality of existing forest regeneration within stands. Expand the width of The Fells viewshed to provide additional habitat for wildlife dependent upon early successional habitat, and increase the view from estate house. Develop silvicultural prescriptions, such as precommercial thinning or soil scarification, to promote regeneration success. Determine an appropriate amount of early successional habitat for the Refuge and maintain it through regular, periodic treatments.

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*	Alternative C *Active Habitat Management and Enhanced Visitor Services*
		years to monitor species presence over time. Ensure Refuge complements larger landscape composition and structure for priority species.	
Meadow Habitat	Over the next 15 years, continue to maintain the existing 1.4 acres of meadow on the southern boundary of the Refuge to support species of conservation concern such as the American woodcock and other species dependent upon meadow habitat. Continue to conduct meadow maintenance to retain herbaceous condition through partners or adjacent landowners.	Within five years, if suitable sites are located, expand the current meadow to a total of 3.0 (+/-) acres, depending on habitat and historical factors, to support species of conservation concern. This would include American woodcock and other migratory and breeding species, dependent upon meadow for habitat. Suitable sites would have site conditions suitable for meadow establishment and be generally devoid of large trees. Any meadow expansion would not be at the expense of mature forest habitat. *In addition to Alternative A strategies:* Identify partnership opportunities to mow the field.	Within ten years, if suitable sites are located, expand the current meadow up to a total of 3.0 +/- acres, dependent upon habitat and historical factors, and explore the potential of creating a second one- to three-acre meadow elsewhere on the Refuge. These enhancements would further support species of conservation concern identified in the BCR 14 and NH WAP plans on the Refuge, including American woodcock and other migratory and breeding species, dependent upon meadow for habitat. Suitable sites would have site conditions suitable for meadow establishment and be generally devoid of large trees. Any meadow expansion would not be at the expense of mature forest habitat.

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
		Review historical records, maps, and stone walls, as well as the habitat inventory, to help determine whether there is an appropriate place to expand meadow acreage on the Refuge. Collaborate with partners including NH FGD and NH Audubon to conduct bird species inventories every 10 to 15 years to monitor species presence over time.	*In addition to Alternative B strategies:* Create a second (one- to three-acre) meadow elsewhere on the Refuge that would not impact mature forest habitat.
Wetlands Habitat	Over the next 15 years, continue to allow natural processes to influence fens, vernal pools and other wetland habitats on the Refuge that may provide important breeding habitat for amphibians and reptiles of conservation concern identified in NE PARC and NH WAP. Record locations of vernal pools and wetland habitats as encountered during other routine Refuge management activities; avoid impacts to known or discovered	Over the next 15 years, protect and monitor Refuge wetlands for the benefit of amphibians and reptiles by completing at least one vernal pool species breeding survey within the next 15 years. In addition, continue to allow natural processes to influence fens, vernal pools and other wetland habitats on the Refuge that may provide important breeding and foraging habitat for amphibians and reptiles of conservation concern identified in the NH WAP, NE PARC, and other regional plans, such as	Over the next 15 years, protect and monitor Refuge wetlands for the benefit of amphibians and reptiles by completing at least one vernal pool species breeding survey within the next 5 years. In addition, continue to allow natural processes to influence fens, vernal pools and other wetland habitats on the Refuge that may provide important breeding and foraging habitat for amphibians and reptiles of conservation concern identified in the NH Wildlife Action Plan and other regional plans, such as

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*	Alternative C *Active Habitat Management and Enhanced Visitor Services*
	wetlands. Encourage partners and volunteers to record observations when visiting the Refuge.	spotted salamander. *In addition to Alternative A strategies:* Monitor to ensure that management activities or trail re-location do not adversely impact the fens. Inventory and georeference vernal pools on the Refuge, before any trail enhancement or habitat management is implemented. Coordinate with NH FGD for survey protocols and data submission to the NH FGD vernal pool database, and Reptile and Amphibian Reporting Program. Record the presence/absence of vernal pool-obligate species according to acceptable survey protocols.	spotted salamander. *In addition to Alternative B strategies:* Explore opportunities to create new and/or enhance existing vernal pools. .
Riparian and In-stream Habitat	Continue to maintain the in-stream habitat and riparian corridor along the approximately 1,750 feet of Beech Brook on the Refuge for species identified as conservation priorities, including brook trout, by the Eastern Brook Trout Joint	Within 5 years, evaluate the quality of the in-stream habitat and riparian corridor along approximately 1,750 feet of Beech Brook for species identified as conservation priorities, including brook trout, by the Brook Trout Joint Venture and NH WAP	Within the next 15 years, enhance the in-stream habitat and riparian corridor along the approximately 1,750 feet of Beech Brook by completing at least one stream enhancement project for species identified as conservation priorities, including brook trout,

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
	Venture and NH WAP plans. Continue to rely on LSPA to monitor Beech Brook and collect water quality data.	plans. *In addition to Alternative A strategies:* Post the area around the mouth of Beech Brook as closed to the beaching of boats. Relocate the Refuge's nature trail away from sensitive riparian areas and/or replace existing crossings with a foot bridge(s) if it is found to negatively affect stream health. Assess the impacts of rafting and other public use, and winter road treatments on the biological health and integrity of Beech Brook and manage to mitigate those impacts. Partner with NHFG to survey to identify key in-stream species and habitat.	according to Eastern Brook Trout Joint Venture and NH WAP guidelines. *In addition to Alternative B strategies:* Work with partners to establish a water quality monitoring site on the Refuge. Identify opportunities for stream rehabilitation and/or riparian restoration, particularly in areas where the current trail intersects or closely parallels Beech Brook. Partner with NHFG to design and implement stream enhancement projects; conduct stream surveys and species inventories, population and habitat assessments for brook trout and rainbow smelt and conduct an amphibian survey of Beech Brook.
Shoreline/Minute Island	Continue to protect the 3,100 feet of undeveloped Refuge shoreline along Lake Sunapee, and 0.1 acre Minute Island by preventing public use	Continue to protect the 3,100 feet of undeveloped Refuge shoreline and 0.1 acres of Minute Island by preventing public use activities that may pose	Continue to protect the approximately 3,100 feet of undeveloped Refuge shoreline and 0.1 acres of Minute Island by preventing public use and

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
	activities that may pose risks to the biological integrity of these habitats. Maintain signs along the Refuge shoreline and Minute Island prohibiting boat landing on the Refuge.	threats to the biological integrity of these habitats. *In addition to Alternative A strategies:* Deploy law enforcement officers to patrol the Refuge on select high-use days, work with NH Marine Patrol to monitor Refuge shoreline use. Install signs closing the Refuge shoreline to all rafting, beaching of boats, and public access from the lake to minimize adverse impacts to the undeveloped shoreline and nearshore habitats. Hire a seasonal Visitor Services Specialist who will help monitor for shoreline policy compliance and shoreline condition from Memorial Day to Labor Day. Increase awareness of Refuge boat landing policies by conducting outreach with town and local marina's by posting flyers. Assess baseline shoreline condition	activities that may pose risks to the integrity of these habitats. *In addition to Alternative B strategies:* Hire a full time Visitor Services Specialist at the Refuge year-round to help monitor shoreline policy compliance and shoreline condition.

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
		and evaluate the need for restoration. Evaluate the impacts, if any, of rafting/ beaching water craft on the Refuge.	
Goal 2. Promote natural resource conservation, stewardship, the mission of the National Wildlife Refuge System and enjoyment of the John Hay Refuge by providing high-quality, compatible, wildlife-dependent public use opportunities on Refuge lands and neighboring conserved lands and waters.			
Responds to Issues: How can we balance increased public use of the Refuge while minimizing user impacts in the future, and how will adding an ADA-compliant trail help to accomplish this? What are the impacts of public use on Beech Brook, and how can we minimize these impacts? What staffing levels are needed to meet our goals of increasing our on-site interpretation, and education and outreach programs to reach a wider audience? How do we effectively conduct education and outreach to explain Refuge rules, regulations, and our policies on rafting, and shoreline use? What partnership opportunities exist to increase the number of educational programs, interpretation, and outreach? Can our partners assist us in fulfilling the six priority public uses on adjacent conserved lands?			
Hunting	Maintain a year-round no-hunting policy on the Refuge over the next 15 years. Continue to work with partners, especially NH FGD, to monitor and enforce when possible a no-hunting policy on Refuge property.	Maintain a year-round no-hunting policy on the Refuge over the next 15 years. *In addition to Alternative A strategies:* Assign notifications of violation to a Refuge Law Enforcement Officer. Work closely with partners to make Refuge visitors aware that hunting is allowed on Forest Society property and other areas in the region.	Within three years of CCP approval, fully evaluate a limited-quota white-tailed deer hunt through the NEPA process and determine its compatibility, in partnership with NH FGD and The Fells. Utilize U.S. Fish and Wildlife Service guiding policies as well as partner and public input. *In addition to Alternative B strategies:* Complete a compatibility determination within 2 years of CCP

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			completion. Coordinate with NHFG, The Fells, and the public to evaluate potential opportunities for a limited quota archery season for white-tailed deer. Complete all required planning documents within 3 years if hunting is determined to be a compatible public use at the Refuge.
Recreational Fishing	Maintain a year-round no-fishing policy on the Refuge over the next 15 years. Continue to work with partners to monitor and enforce when possible a no-fishing policy on Refuge property.	Within two years of CCP approval, open the Refuge to sport fishing. Provide limited access for anglers via the proposed southern parking lot and potential new trail from the lot to the lakeshore for fishing. Monitor public use impacts on habitats associated with trail. Coordinate with NHFG, The Fells, local government officials, local conservation organizations, and the public to establish a fishing program. Install a gate and signs at the angler parking area to restrict motorized access to the Refuge and to provide	Within two years of CCP approval, open the Refuge to sport fishing, and within five years of CCP approval, enhance the existing Ecology Trail to conform to ADA guidelines. *In addition to Alternative B strategies:* Conduct trail improvements that would conform to ADA requirements and increase public safety by including a packed surface, a wider walkway and better markings that would lead to a platform at the lake shore.

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
		information. Install signs at The Fells parking lot to explain angler parking is not allowed in this lot.	
Wildlife Observation and Photography	Maintain quality wildlife observation and photography opportunities throughout the approximately 80 acres of the Refuge over the next 15 years, especially along the 0.9 mile self-guided Ecology Trail. Continue to collaborate with partners on trail maintenance as needed. Continue to provide materials (e.g., Ecology Trail self-guided interpretive flyer) for these activities.	Enhance quality wildlife observation and photography opportunities throughout the approximately 80 acres of the Refuge over the next 15 years by implementing trail improvements. These would include considerations for increasing public safety, minimizing adverse impact to sensitive habitats, and providing greater access to the diversity of Refuge habitats, including one of the fens. *In addition to Alternative A strategies:* Maintain boundary signs. Create trail improvements, including: an alternative route from the current Ecology Trail back to the trailhead on Refuge property, relocating the Ecology Trail away from sensitive habitat, installing footbridge(s) at	Enhance quality wildlife observation and photography opportunities throughout the approximately 80 acres of the Refuge by instituting trail improvements that would increase safety, and focus traffic to a better defined trail. This would have the added benefit of being ADA-compliant, including a wildlife viewing platform, with aesthetic and environmental considerations in mind, on the lakeshore over the next 15 years. *In addition to Alternative B strategies;* Conduct trail improvements that would include the installation of a hard surface, increasing the width to about five feet, better distinguishing it from its environs, and leading to a wildlife viewing platform at the lake shore, if

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		stream crossings, and adding an extension from Ecology Trail to one of the fens. Monitor public use impacts on habitats associated with all trail additions. Coordinate with partners to increase awareness of and opportunities for wildlife-dependent recreation experiences on the Refuge and adjacent lands. Install additional interpretive signs along the trail and trail additions, and a kiosk with interpretive panels and fact sheets at the trailhead of The Fells proposed parking lot.	feasible. This would have the added benefit of being ADA compatible.
Environmental Education and Interpretation	Over the next 15 years, continue to maintain existing interpretive signs and brochure, and to rely on strong partnerships with The Fells, Forest Society, and other partners to provide opportunities for interpretation and environmental education on the Refuge. Continue the spirit of cooperation with The Fells from the old MOU,	Over the next 15 years, conduct interpretive and environmental education programs and create informational materials that cumulatively reach 50 percent of the total visitors to The Fells between Memorial Day and Labor Day. *In addition to Alternative A strategies:*	Over the next 15 years, conduct interpretive and environmental education programs and create informational materials that reach 50 percent of the total visitors to The Fells throughout the year, and conduct at least five offsite programs per year. *In addition to Alternative B strategies:* Hire a full-time permanent Visitor

Refuge Resource or Program	**Alternative A** *Current Management*	**Alternative B** *Service-preferred alternative*	**Alternative C** *Active Habitat Management and Enhanced Visitor Services*
	and pursue an updated MOU. Continue to maintain the interpretive stations along the Ecology Trail and provide the self-guided interpretive trail brochures. Continue to offer the Refuge to partners offering outdoor environmental education.	Advertise events in local papers. Partner with others including The Fells, LSPA, Forest Society, and NH Audubon for educational programming, materials distribution, and additional NWR information at key sites, and provide educational materials and supplies to teachers. Hire a seasonal Visitor Services Specialist (i.e., Memorial Day through Labor Day) co-located with The Fells at the gatehouse to present interpretive programs and walks on the Refuge, develop interpretive fact sheets, and conduct one teacher's workshop including supplying educational materials and supplies. Design and install interpretive signs along Refuge trails to replace existing numbered stations. Install a kiosk at the trailhead in the new parking area and supply it with updated materials within 2 years of construction.	Services Specialist to develop programs for local school systems, schedule environmental education-oriented field trips, conduct outreach programs at Mount Sunapee State Park and local campgrounds, participate in local events, give presentations to local civic groups and develop a Refuge website. In addition, establish and maintain relationships with local governments and Refuge partners.
Goal 3. Communicate and collaborate with local communities, federal and state agencies, The Fells, and conservation organizations			

Refuge Resource or Program	Alternative A *Current Management*	Alternative B *Service-preferred alternative*	Alternative C *Active Habitat Management and Enhanced Visitor Services*
throughout the Lake Sunapee region to promote natural resource conservation, stewardship and the mission of the National Wildlife Refuge System.			
Responds to Issues: What partnership opportunities exist to increase the number of educational programs, interpretation, and outreach?			
Partner and Community Outreach	Over the next 15 years, continue to work closely with The Fells to conduct outreach, and meet with partners on an as-needed basis, or as important issues arise. Continue to work with The Fells and Forest Society and their outreach opportunities to reach a broader audience in the community. Meet with partners as needed at The Fells to maintain communication about maintenance, visitor services, administration and management of the Refuge. Continue the spirit of cooperation with The Fells from the old MOU, and pursue an updated MOU.	Continue to work closely with partners and increase community understanding and appreciation of the Refuge's importance to natural resource conservation and its contribution to the Refuge system, and garner additional support for Refuge programs, by meeting with partners at least once a year, and by conducting at least one community outreach program between Memorial Day and Labor Day. *In addition to Alternative A strategies:* Keep local communities informed about Refuge events and attractions through direct contacts and local and statewide publications. Issue news releases on significant accomplishments, to advertise special events, and to announce major management initiatives, in cooperation with partners.	Continue to work closely with partners and increase community understanding and appreciation of the Refuge's importance to natural resource conservation, its contribution to the Refuge system, and to garner additional support for Refuge programs, by conducting at least five outreach programs per year. *In addition to Alternative B strategies:* Conduct an annual coordination meeting at The Fells for partners to update each other on accomplishments and upcoming activities, and continue to meet with The Fells on an ongoing basis. Honor requests for speaking engagements by local community and civic organizations to inform members about Refuge purposes and activities, as staff numbers and resources allow.

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			Create a new Refuge website. Provide environmental education workshops and encourage citizen science projects in cooperation with partners, as staff numbers and resources allow.
Outreach to Elected Officials	Over the next 15 years, inform elected officials about the Refuge purposes and management activities as important issues arise. Keep federal, state, and town officials apprised of Refuge activities as issues arise.	Over the next 15 years, inform elected officials about the Refuge purposes and management activities at least once a year, or as important issues arise. Meet with town select board or a town-designated commission at least once a year to provide an update on Refuge activities, and with elected officials on an as-needed basis. Provide written or personal briefings for members of Congress, or their staff, as needed or as requested, to inform them about important Refuge issues. Invite federal, state, and local elected officials to attend and participate in outreach events held on the Refuge in cooperation with partners.	*In addition to Alternative B objective and strategies:* Invite federal elected officials to attend guided tours of the Refuge to display particular accomplishments, gain a better understanding of the Refuge, demonstrate management activities, and highlight challenges.

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Intergovernmental Partnerships	Over the next 15 years, continue to communicate with federal, state, and local governmental agencies to fulfill mutual natural resource conservation goals as needed, or as important issues arise. Keep governmental partners apprised of Refuge activities as needed. Continue to coordinate with the local governments in the Lake Sunapee Region as issues arise. Continue to coordinate with NHFG on fish and wildlife management as issues arise.	Over the next 15 years, work to strengthen and enhance partnerships with federal, state, and local governmental agencies to fulfill mutual natural resource conservation goals. Coordinate with NHFG and the Newbury Conservation Commission for resource management activities on or that may potentially affect the Refuge. Continue to coordinate with the local governments in the Lake Sunapee Region. Continue to coordinate with NHFG on fish and wildlife management facilitating close collaboration on biological, recreational, and law enforcement programs. Coordinate water quality efforts and issues with NH DES via the Lake Sunapee Protective Association.	*In addition to Alternative B objective and strategies:* Actively participate in town/region conservation planning efforts, particularly in terms of the Refuge's role in habitat conservation with respect to the larger landscape.